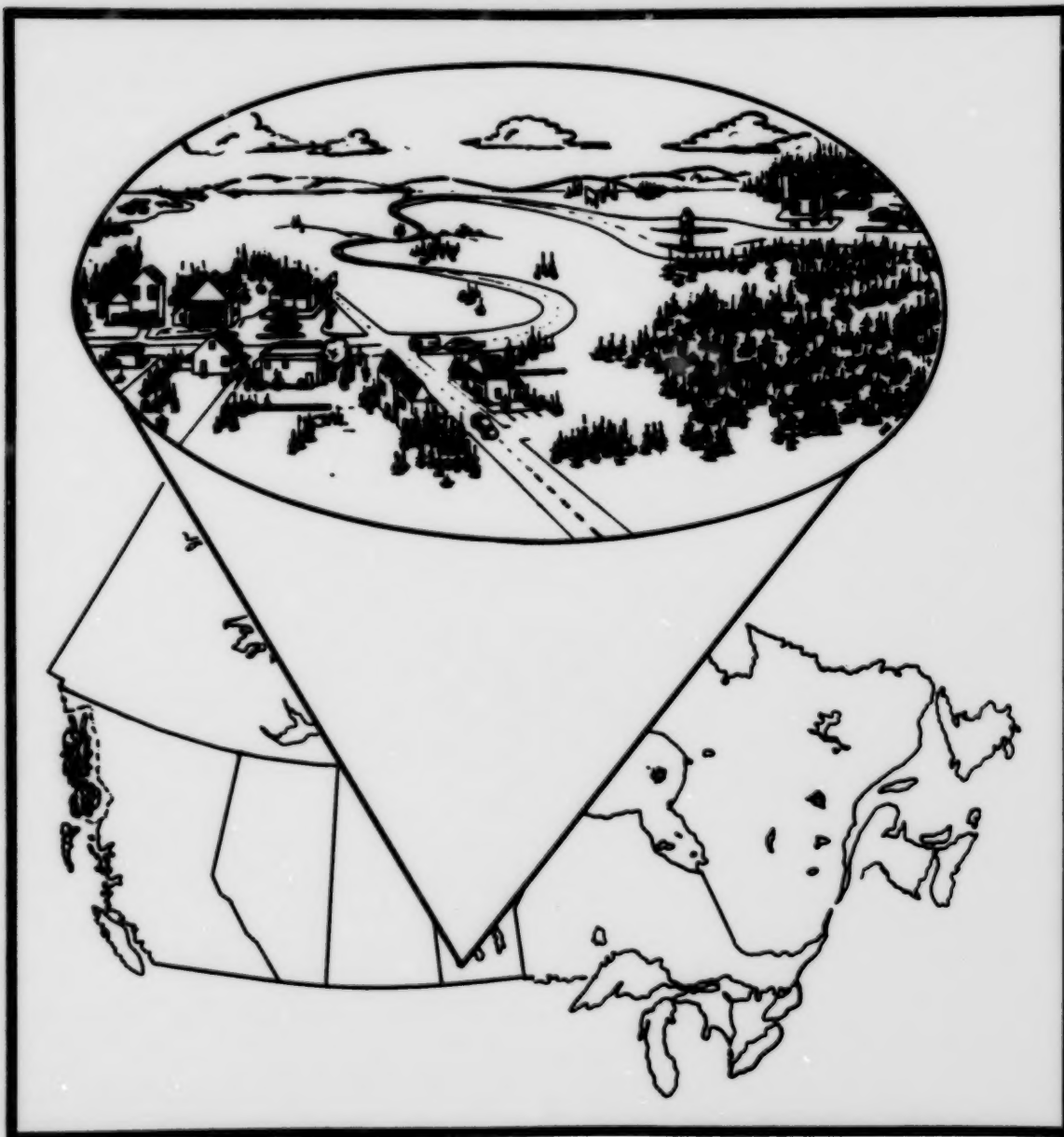


# **User Guide: Tiebout Local Economic Impact Model**



**Evaluation and Analysis  
Division  
Socio-Economic Branch  
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## SUMMARY

In addition to carrying out its mandate to identify, protect and present to the public samples of the natural and cultural heritage of Canada, Parks Canada is interested in knowing the impact of its activities on the Canadian economy. For several years now, Parks Canada has therefore used certain economic impact models, including the Statistics Canada national input-output model and the "Tiebout" local economic impact model.

Although the "Tiebout" model has already been used on several occasions to assess the income and employment impact of an existing or new park on its immediate environment, its use requires some theoretical knowledge and numerous calculations. So, in order to facilitate and promote its use, the model was set up on a computer. Its use requires no programming skills; it is designed primarily for professionals familiar with economic impact models. This report is a practical user's guide for that model.

### Income Effect

The impact of park or historical site expenditures on local income is evaluated by using an approach that blends two different concepts. The first, developed by C.M. Tiebout in the early 60's, involves an income multiplier for the local residents' expenditures. More recently, researchers such as R.L. Burford and J.L. Katz introduced multipliers related to firms' purchases which have a mathematical formulation very similar to that developed by C.M. Tiebout.

Thus, the equation for local residents' expenditures is:

$$YT = Y1 * (1 / (1 - K1 * K2))$$

where

YT: Direct and induced income earned by local residents due to the presence of the park or the site.

Y1: Direct income earned by local residents due to the presence of the park or the site.

K1: Proportion of income earned by local residents that is spent locally on goods and services.

K2: Proportion of purchases by local residents that is paid out as income to local employees and employers.

The direct income earned by local residents results from five types of park or site expenditures:

- 1) wages and salaries paid out by the park to local residents for park operations;
- 2) purchases of local goods and services by the park for park operations;
- 3) wages paid by the park or the contractor to local residents for construction purposes;
- 4) purchases of local goods and services by the park or the contractor for construction purposes;
- 5) purchases of local goods and services by park visitors.

The total wages and salaries paid by the park or the contractor constitute direct income. Only a portion of the purchases by visitors and of those for goods and services related to operation and construction is counted in the direct income. This is estimated by means of parameters K3, K4 and K5 supplied by the user or calculated by the program.

The induced income is due to the successive expenditures by local residents. For instance, employees of local firms spend a portion of their income on local goods, thus generating income for other local employees. The latter in turn spend a portion of their income on local goods. The process is repeated until there are no further increments in local income.

The equation pertaining to local firms' purchases is:

$$YE = Y1 * (1 / (1 - K6) - 1)$$

where

YE: Indirect income earned by local residents due to purchases by local firms.

Y1: Direct income earned by local residents due to the presence of the park or the site.

K6: Proportion of local firms' total receipts used to purchase local goods and services.

Indirect income is due to successive local expenditures by local firms. For instance, a local firm sells to park visitors one million dollars worth of goods and services. As a result, the firm must restock, and it does so by purchasing

a portion of its requirements from local firms, thus generating local income. In turn, these local firms must themselves restock. The process is repeated until there are no further local purchases by local firms.

#### Employment Impact

The impact of park or site expenditures on local employment is estimated similarly to the income effect. Job creation is estimated in terms of direct, indirect and induced jobs. Jobs related to the operation, maintenance and development of the park, as well as those related to visitors' purchases are deemed to be direct jobs. Indirect and induced jobs are those associated with subsequent expenditure rounds.

Direct employment related to construction work is estimated from profit rate, overhead and wage and salary assumptions. As for direct employment created by visitors' and park's purchases, and for indirect and induced jobs, two approaches are available. The first approach is based on local firms' sales figures, while the second one uses the average weekly wage in the area.

With the first approach, the employment that is generated is estimated by assuming that the number of local jobs increases in the same ratio as local sales. The result is subsequently adjusted to account for the firms' capacity. For instance, if local firms are operating below capacity, they could double their sales without doubling the number of their employees.

With the second approach, the employment that is generated is estimated by dividing income created by the average local wage, while taking into account the capability of local firms to sustain a higher level of sales without having to increase the number of employees.

Needless to say, the second approach is much easier to use and requires statistics that are readily available.

#### Computerization of the Approach

The "Tiebout" model, written in BASIC, was implemented on an IBM-PC computer. A second program, "Support", was developed to manage the data banks pertaining to the "Tiebout" program. Since the number of statistics required to assess the economic impact may exceed one hundred and eighty, availability of a simple, effective means to build, modify and subsequently keep the data banks is essential. Utilization of this

user-friendly WYLBUR program requires no programming skills. It is also by means of this program that the user enters the "Tiebout" program, lists the existing data banks and eliminates useless ones.

Thirty-two different types of information are included in a data bank. When using the "Support" program, these different types of information appear successively on nine screens. Their definition and order of appearance in the "Support" program are shown in Table 3, Chapter 2 of this report. It is not always necessary that the data regarding these types of information be non-zero; nor is it always necessary for the user to know these data. In some cases, the user has very little information but can nevertheless run the "Tiebout" program. In the application examples given in Chapter 2, the amount of non-zero information varies considerably from one example to another. By looking at these examples, the user will gain a solid understanding of how a data bank should be structured.

When the user prepares a data bank, he must specify the number of visitor, expenditure and construction types to be included in the analysis. At the most, four, four and five types, respectively, can be specified. In regard to the years to be analyzed, the user must indicate the first year and the total number of years to be analyzed. The maximum number of years that can be studied is ten. Once these data have been supplied to the program, the latter prepares the data bank formats accordingly.

Also, it is in the data bank that the user specifies whether he wants the value of the various K1 to K6 parameters to be computed by the program or whether he prefers to assign those values himself. This is also where he specifies whether it is the wage or sales figures he wants to be used in computing the employment thus generated. These choices are made by specifying nil values for certain data and positive values for others.

Once the data bank has been completed, it is very easy to run the "Tiebout" program. The user must specify which data bank he wants to enter, in what language he wants the results to appear and what is the date of entry. Following these operations, the result tables are printed out one at a time. No result is sent to the screen. All the data included in the data bank are printed out in the various result tables. The user may thus easily check at any time the data and the parameters that led to a given result. Once the last table has been printed, the "end of program" message appears and the "Support" program assumes control over the screen. The user may then end the session.

### Conclusion

Computerization of the "Tiebout" model enables the analyst to save valuable time in assessing the economic impact of a national park or a historical site. Use of this program could lead to improved park or historical site management and planning, while providing answers to the questions local communities might have regarding the economic impact of Parks Canada projects.

However, one must be aware of the numerous constraints and limitations of this type of model. The scope of this kind of exercise is limited by considerations of geographic framework, transfer payments, part-time employment, municipal finance, corporate investment expenditures, etc. This model can therefore only generate a portion of the economic information that one must try to estimate in the course of a local economic impact study.

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## INTRODUCTION

Although the basic objectives of Parks Canada are to protect Canada's natural and cultural heritage and to encourage awareness and appreciation of that heritage in order to preserve and safeguard it, Parks Canada is also interested in knowing the economic impact of its activities. For a few years now, Parks Canada has therefore used some economic impact models. In order to evaluate the national impact of the program of Parks Canada as a whole, the Statistics Canada national input-output model was used on several occasions. The Statistics Canada interprovincial model is the basis for a computer program developed in order to assess the provincial economic impact of specific capital projects. Finally, the local economic impact of setting up new parks or operating existing parks has also been repeatedly evaluated by Parks Canada using the so-called "Tiebout" approach.

In order to facilitate the assessment of the economic impact of a new or existing park on its immediate environment, the "Tiebout" approach has been computerized. The user no longer has to know all the finer points of the approach, nor does he have to carry out the numerous calculations usually required. This makes it easier to assess the local economic impact in terms of labor income and generated employment concerning several options and years of operation. This approach is designed primarily for economists and professionals familiar with economic impact models and the present report aims at being a practical guide for model users. With this type of model, Parks Canada can meet several requirements, the major ones being:

- Informing the local community, the planners and the administrators as to the economic impact on the human environment of the investment projects and operating expenditures of Parks Canada;
- Generating the information required by Parks Canada Directive 2.2.1. (April 1983). This directive deals with socio-economic analysis in national park management planning. The social and economic studies required by that directive include the determination of the economic impact of a park and its visitors' expenditures;
- Releasing the funds required for the project. Treasury Board increasingly requires detailed information regarding the impact of investment projects and current expenditures by the various Departments.

This report is subdivided into two parts. Part one presents the theoretical model and discusses some methodological aspects of the approach. Part two deals with the use of the computer program, specifying the program characteristics, the data bank features and some practical examples. The report as a whole should provide readers with a practical understanding of the local economic impact model.

## CHAPTER 1 THEORETICAL MODEL

### 1.1 Income effect

The impact of park or historical site expenditures on local income is evaluated by a microeconomic-type approach. In 1962, C.M. Tiebout developed what is now known as the economic base model. He subdivided the economy into three sectors: local consumption, exports and local investment. Assuming that the export and investment sectors were dependent upon forces not tied to local income, he showed that the income effect could be determined by tracking down expenditures throughout the area by means of regional multipliers related to local consumption. More recently, in the 70's, researchers such as R.L. Burford and J.L. Katz introduced output multipliers, i.e. multipliers linked to corporate production, which required no input-output tables and which had a mathematical formulation highly similar to that developed by C.M. Tiebout. The approach used in this report attempts to blend these two concepts.

The total income effect of the park is seen as the sum of two components: (1) direct spending related to the park, and (2) indirect and induced spending resulting from this direct spending.

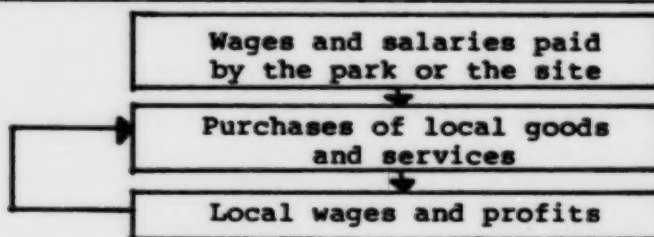
A series of different multipliers can be used to estimate the total income effect of the park. Each multiplier is related to type of direct expenditures made within the local economy in connection with the park or the site. These expenditure categories are:

- 1) wages and salaries paid out by the park to local residents for park operations;
- 2) purchases of local goods and services by the park for park operations;
- 3) wages paid by the park or the contractor to local residents for construction purposes;
- 4) purchases of local goods and services by the park or the contractor for construction purposes;
- 5) purchases of local goods and services by park visitors.

In order to arrive at a clear understanding of the methodology employed here, it will be useful to trace the steps in the income summation process. For the wage and salary input for example, one should consider the following sequence of events: (1) the park pays its employees; (2) these employees spend a portion of this income on local goods and services; (3) a

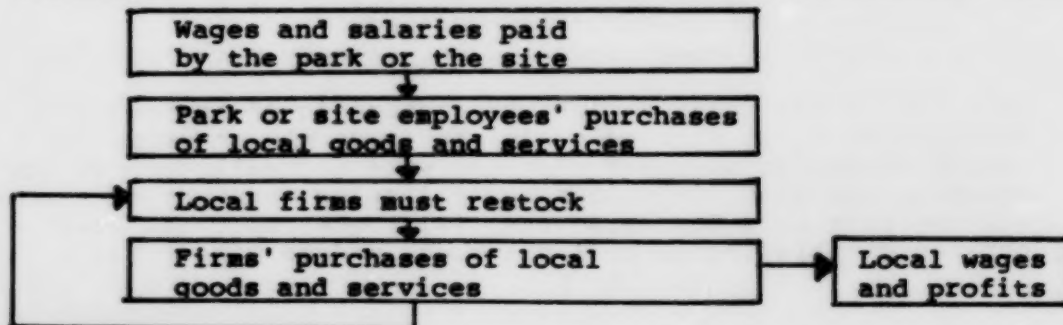
proportion of these local sales are paid out as income to local employees and local employers; (4) a portion of this income is then respent on local goods and services; (5) steps (3) and (4) are repeated. Economists call this process the household expenditure multiplier effect. It is the induced effect. Graph 1 illustrates this mechanism.

GRAPH 1  
Induced effects



A second income summation process, the indirect effect, adds to this effect: (1) Employees spend a portion of their income on goods and services purchased from local firms; (2) the firms must then restock; (3) a portion of the purchases of those firms is channeled to local firms; (4) a proportion of the latter's sales is paid out as income to local employees and employers; (5) these firms themselves must restock and steps (2), (3) and (4) are repeated. This process is shown in Graph 2. A glance at these multiplier effects due to indirect and induced expenditures reveals that the additional income due to the park's wage and salary payments to its employees (direct impact) does not by itself constitute the full income increment.

GRAPH 2  
Indirect effects



### 1.1.1 Induced effect

Mathematically, the induced effect can be formulated as follows for each of the five expenditure types shown above:

#### Wages and salaries paid for park operation and construction:

$$Y_1 = Y_{01} + Y_{01} \cdot (K_1 \cdot K_2) + \dots + Y_{01} \cdot (K_1^n \cdot K_2^n) \quad (1)$$

where

Y<sub>1</sub>: Direct and induced income effect of the park's wage and salary payments to local residents for park operation.

Y<sub>01</sub>: Amount of wage and salary payments to local residents for park operation.

K<sub>1</sub>: Proportion of income earned by local residents that is respent on local goods and services, i.e. average propensity to spend locally.

K<sub>2</sub>: Proportion of local sales to local residents that is paid out as income to local employees and employers.

Since equation (1) is a geometric series, Y<sub>1</sub> may be given as:

$$Y_1 = Y_{01} / (1 - K_1 \cdot K_2) \quad (2)$$

where

$$0 \leq K_1 \cdot K_2 \leq 1$$

The parameters to be estimated are K<sub>1</sub>, the proportion of local residents' income that is respent locally, and K<sub>2</sub>, the proportion of local sales to residents that is paid out as income to employees and employers. The process is the same for wage and salary payments during construction.

#### Park's purchases of local goods and services:

The park's purchases of local goods and services generate income for local firms. However, unlike wage and salary payments, these expenditures involve more than just the direct income to employees and employers, as a portion of earnings is used to restock, to pay overhead, etc. The first round of income which is the income to local residents has to be

appraised; therefore we have the following equation:

$$Y02 = K3 \cdot Y12 \quad (3)$$

where

Y02: Amount of direct income received by local employees and employers as a result of the park's purchases of goods and services for park operation.

K3: Proportion of park's local purchases received as income by local employees and employers.

Y12: Amount of park's purchases of local goods and services for park operation.

After evaluating the first round of income Y02, the methodology used for wage and salary payments (equation 2) can be used once again.

$$Y2 = Y02 / (1 - K1 \cdot K2) \quad (4)$$

where

Y2: Direct and induced income effect of the park's purchases of goods and services.

Y02: Amount of direct income received by local employees and employers as a result of the park's purchases of goods and services for park operation.

Local purchases by park visitors and local purchases for construction purposes:

In order to obtain the income induced by the visitors' local purchases and by local purchases for construction, the same method is used as for park expenditures on local goods and services, i.e. by determining the first round of local resident income, then applying equation (2). The amount of visitors' purchases is obtained by solving the following equation:

$$Y03 = K4 \cdot Y13 \quad (5)$$

where

Y03: Amount of direct income received by local employees and employers as a result of visitors' local purchases of goods and services.

K4: Proportion of park visitors' local purchases received as income by local employees and employers.

Y13: Amount of park visitors' purchases of local goods and services attributable to the park.

The following equation must be solved in order to obtain the amount of local goods and services purchased for construction purposes:

$$Y04 = K5 \cdot Y14 \quad (6)$$

where

Y04: Amount of direct revenue received by local employees and employers from the park's or the contractor's purchases of local goods and services for construction purposes.

K5: Proportion of the park's or the contractor's local purchases for construction purposes received as income by local employees and employers.

Y14: Amount of the park's or the contractor's purchases of local goods and services for construction purposes.

#### 1.1.2 Indirect effect

The indirect effect equations, similar to the induced effect equations, are:

Wage and salary payments for park construction and operation:

$$YA = Y01 \cdot K1 \cdot K2 \cdot (1 / (1 - K6) - 1) \quad (7)$$

where

YA: Indirect income due to wages and salaries paid locally.

Y01: Wage and salary payments to local residents.

K1: Average propensity to spend locally.

K2: Proportion of local sales to local residents that becomes local income.

K6: Proportion of local firms total receipts that is used to buy local goods and services.

This equation is comparable to equation (2). The only differences are the presence of the terms "-1" within the brackets and "Y01\*K1\*K2" before the bracket. Due to the presence of "-1", the final result of this formula is the indirect effect only, rather than the total income generated. In this way, direct income is only counted once in the multiplier process. The "Y01\*K1\*K2" term corresponds to the income received by local employees and employers as a result of local purchases by the park or the site employees.

Purchases of local goods and services by the visitors and by the park for construction and operation purposes:

$$YB = Y12 * KJ * (1 / (1 - K6) - 1) \quad (8)$$

where

YB: Indirect income from the purchases by visitors and by park of local goods and services.

Y12: Amount of visitor or park or site purchases of local goods and services.

KJ: Proportion of local purchases received as income by local employees and employers: K3 for park operations, K4 for visitors' purchases, and K5 for construction.

As in the case of the induced effect, the first round of local resident income is determined by means of the term "Y12\*KJ". Subsequently, the multiplier effect is added by means of the term " $((1/(1-K6))-1)$ ".

### 1.1.3 Construction expenditures

Some of the five categories of local park or site expenditures are not directly available. Indeed, since construction is generally done by a contractor or by the Department of Public Works, Parks Canada does not always compile the statistics pertaining to it. The park's or contractor's wage and salary payments to local residents as well as the park's or contractor's purchases of local goods and services for construction purposes must be estimated. The formula for computing the amount of local wages and salaries generated by

construction is:

$$Y01C: \sum_{j=1}^m Y114j * (1 - TPROF) * TSALj * PSCL, \text{ for } j = \begin{matrix} \text{construction} \\ \text{type} \end{matrix} \quad (9)$$

where

Y01C: Wage and salary payments to local residents, for construction purposes.

Y114j: Total amount of construction expenditures for construction type j.

TPROF: Profit and overhead in the construction industry, per purchase dollar.

TSALj: Wages and salaries in the construction industry, per purchase dollar, for construction type j (after profit and overhead).

PSCL: Proportion of construction wages and salaries paid to local residents.

The amount of wage and salary payments to construction workers is estimated by assuming a profit and overhead rate of x percent and after-profit wage and salary rates of n percent, depending on the type of construction. A distinction is made between different types of construction because the ratio of wages and salaries to material purchases may vary considerably from one type of construction to another. Subsequently, construction wage and salary payments to local residents are estimated using PSCL.

The equation for the construction purchases of local goods and services is similar to equation (9). Thus:

$$Y14 = \sum_{j=1}^m Y114j * (1 - TPROF) * (1 - TSALj) * TAMLj, \text{ for } j = \begin{matrix} \text{construction} \\ \text{type} \end{matrix} \quad (10)$$

where

Y14: Amount of park's or contractor's purchases of local goods and services for construction purposes.

TAMLj: Purchases of local materials by the construction industry, per purchase dollar, for construction type j (after profit, overhead, wages and salaries).

The terms TPROF and TSAL were defined in equation (9). The amount of construction purchases of goods and services is calculated by subtracting profits and wages and salaries from construction expenditures. The term TAML is then applied to distinguish purchases that originated locally from overall material purchases.

## 1.2 Employment impact

The local employment impact of park or site local expenditures is evaluated similarly to the income effect. Direct, indirect and induced job creation is estimated. Jobs related to the operation, maintenance and development of the park, and those related to the visitors' local purchases will be considered direct employment. Indirect and induced jobs are those related to subsequent rounds of expenditures and are necessarily dependent upon indirect and induced expenditures.

The number of direct local jobs related to the park operation is estimated directly by the park managers. The number of construction related jobs is determined by dividing the amount of wage and salary payments to local residents, estimated in equation (9), by the average annual wage and salary figure in the construction industry of the area. In order to estimate direct employment created by visitors and by the park's purchases as well as the indirect and induced employment, two approaches may be used. The first one is based on the sales statistics of local firms, while the second one uses the average weekly wage in the area.

### 1.2.1 Total sales based approach

This evaluation method is the more complex of the two, requiring a greater number of equations and data that are less reliable and more difficult to obtain.

The direct employment due to the park's and visitors' purchases is estimated by assuming that the ratio between direct park and visitor generated employment and the total employment of local firms is proportional to the ratio between the park's and visitors' purchases of goods and services and the total sales of local firms. Mathematically, this ratio writes as follows:

$$\frac{EDA}{ET} = \frac{ADA}{ST} \quad (11)$$

where

EDA: Direct employment due to the park's and visitors' purchases of goods and services.

ET: Total employment by local firms.

ADA: Park's and visitors' purchases of goods and services, including purchases of goods and services for construction purposes.

ST: Total sales of local firms.

When using ratio (11), it is assumed that local firms are operating at capacity and that an increase in sales will generate an equivalent increase in employment. This assumption is not always valid and could lead to overestimating the number of jobs created. Indeed, in small towns many firms often operate below their maximum potential. In order to account for this low productivity effect, an adjustment factor is introduced into the ratio (11), which becomes:

$$\frac{EDA}{ET} = \frac{ADA}{STL \cdot K7} \quad (12)$$

where

K7: Proportion by which local sales must increase in order to create one job.

Coefficient K7 is greater than one if firms are not operating at capacity; conversely, it is less than one if firms have a work overload.

Indirect and induced employment is estimated by means of an equation similar to equation (12). Thus, the following equation:

$$\frac{EII}{ET} = \frac{AII}{ST \cdot K7} \quad (13)$$

where

EII: Indirect and induced employment due to the presence of the park or the site.

ET: Total employment by local firms.

AII: Indirect and induced purchases due to the presence of the park or the site.

ST: Total sales by local firms.

The estimate of indirect and induced purchases due to the park or the site is the sum of several components:

A) Purchases by park workers and the employees of local firms, i.e. induced purchases:

$$AI1 = (Y01+Y01C+Y02+Y03+Y04)*K1*(1/(1-K1*K2)) \quad (14)$$

where

(Y01+Y01C+Y02+Y03+Y04): Total direct income due to the presence of the park or the site.

AI1: Induced purchases due to the presence of the park or the site.

B) Indirect purchases generated by park or site operation and construction employees (see graph 2):

$$AI2 = (Y01+Y01C)*K1*(1/(1-K6)-1) \quad (15)$$

where

(Y01+Y01C): Wage and salary payments to local residents for park or site operation and construction purposes.

AI2: Indirect purchases resulting from salary payments made for park or site operation and construction.

C) Indirect purchases generated by purchases of goods and services from park or site operation and construction and from visitors.

$$AI3 = (Y12+Y13+Y14)*(1/(1-K6)-1) \quad (16)$$

where

Y12+Y13+Y14: Visitors' and site operation and construction purchases of goods and services.

AI3: Indirect purchases due to operations, to construction and to visitors.

After estimating equations (14), (15), and (16), it is easy to obtain the total indirect and induced sales and subsequently to compute indirect and induced employment by using equation (13).

### 1.2.2 Wage and salary based approach

Using this evaluation method, generated employment is computed from estimates of direct, indirect and induced income. Thus, the number of indirect jobs is estimated by means of the following equation:

$$EI = (YA+YB)/(SALAL*52*K7) \quad (17)$$

where

EI: Indirect employment due to the presence of the park or the site.

YA+YB: Indirect income generated locally.

SALAL: Average weekly wage in local firms.

K7: Proportion by which local sales must increase in order to create one job.

Equation (17) merely divides indirect income by the local average annual wage, while taking into account the capability of local firms to sustain a higher level of sales without having to increase employment. The same ratio is used for induced employment and direct employment due to the park's and visitors' purchases.

It can be shown analytically that the two approaches are equivalent if the average annual wage is computed taking into account the employers, and if the proportion of local firms' total sales that becomes income is equal to that proportion of the purchases due to the presence of the park or the site which becomes income. However, even when these conditions are not met, the results of the two approaches can be expected to be similar.

### 1.3 Evaluation of parameters K1, K2, K3, K4, K5, K6

As mentioned earlier, the various parameters, K1, K2, K3, K4, K5 and K6 are necessary for computing direct income and the multiplier effects. In previous studies by Parks Canada, these parameters were obtained by various methods. In some

cases, surveys were used to generate the information required to compute these parameters, whereas in other cases the resources required for a survey were not available and the analyst had to use secondary data as an estimate of these parameters. The computer program leaves it up to the user to select the evaluation method; he may set the value of the parameters, or he may supply the information required to compute the parameters.

### 1.3.1 Parameter calculation based on surveys

The parameter calculation is relatively simple but requires data that are sometimes difficult to obtain. This section presents each parameter in mathematical form, with comments as required.

#### K1 (Average propensity to spend locally)

$$K1 = \frac{ALRL}{RTRL} \quad (18)$$

where

ALRL: Local residents' purchases of goods and services from local firms.

RTRL: Total income of local residents.

Estimates based on the "Provincial Economic Accounts"<sup>1</sup> have shown that the propensity to consume ranges from 0.69 to 0.74, depending on the province. This means that if local residents purchase all their goods and services locally, the propensity to consume locally will be at most 0.69 to 0.74. K1 may also be estimated as follows:

$$K1 = PCP \cdot PAL \quad (19)$$

where

PCP: Propensity to consume by province.

PAL: Proportion of local residents' purchases from local firms.

This method requires data that are more readily available than those required for equation (18). However, the value of parameter K1 is less accurate because equation (19) assumes that the province's propensity to consume will be the same as

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1 Statistics Canada, Catalogue 13-213.

that of the local area under study, which is not necessarily the case.

K2 (Proportion of local purchases by local residents transformed into local revenue)

$$K2 = \sum_{i=1}^n (PALRL_i * PREEL_i), \text{ for } i = \begin{matrix} \text{type of expenditures (20)} \\ \text{or firms} \end{matrix}$$

where

$PALRL_i$ : Proportion of local purchases by local residents spent within sector  $i$ .

$PREEL_i$ : Employees' and employers' income as a percentage of sales in sector  $i$ .

K2 is thus a weighted average; it is the proportion of each sector's sales paid out as income to local residents, weighted by the proportion of local residents' expenditures within each of those sectors. To calculate K2, the following data must be identified: a) total sales of firms operating within the area, b) income paid out by these firms to local residents, and c) local residents' purchases from local firms.

Statistics on sales and income paid out by local firms are usually obtained from surveys of local firms or from meetings with local Chambers of Commerce. Statistics Canada also compiles these statistics when preparing the interprovincial input-output model. Table 1, based on this work, shows the workers' income, as a percentage of sales in the food and accommodation, retail and amusement and recreation sectors, by province, for 1979. The table shows that the workers' income, within a given sector, varies little from one province to another. The same phenomenon probably occurs locally. Under these circumstances, the provincial data would be satisfactory approximations of the local statistics. On the other hand, the statistics included in this table do not comprise employers' income. In order to be used in a local economic impact study, these data should therefore be adjusted upward.

TABLE 1

Worker's income, as a percentage of sales in  
certain industries, by province, for 1979

| INDUSTRY                 | PROVINCES |      |      |      |      |      |      |      |      |      |
|--------------------------|-----------|------|------|------|------|------|------|------|------|------|
|                          | NFLD      | PEI. | N.S. | N.B. | QUE. | ONT. | MAN. | SAS. | ALB. | B.C. |
| Food and accommodation   | 0.34      | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 |
| Retail                   | 0.41      | 0.55 | 0.51 | 0.40 | 0.41 | 0.50 | 0.41 | 0.46 | 0.40 | 0.64 |
| Amusement and recreation | 0.20      | 0.21 | 0.21 | 0.22 | 0.23 | 0.20 | 0.21 | 0.22 | 0.19 | 0.21 |

Source: Statistics Canada, Input-Output Division

K3 (Proportion of park or site local purchases transformed  
into local income)

$$K3 = \sum_{i=1}^n (PALP_i * PREEL_i), \text{ for } i = \text{type of expenditures (21) or firms}$$

where

$PALP_i$ : Proportion of park or site local purchases spent within sector  $i$ .

$PREEL_i$ : Employees' and employers' income as a percentage of sales in sector  $i$ .

Similarly to K2, K3 is a weighted average; it is the proportion of total sales of each sector paid out as income to residents, weighted by the proportion of park or site expenditures in each one of those sectors. The data required for this evaluation are: a) total sales of firms operating in the area, b) income paid out by these firms to local residents, and c) park's or site's purchases from local firms.

K4 (Proportion of visitors' local purchases transformed into local income)

$$K4 = \sum_{i=1}^n (PALV_i * PREEL_i), \text{ for } i = \begin{matrix} \text{type of expenditures} \\ \text{or firms} \end{matrix} \quad (22)$$

where

$PALV_i$ : Proportion of visitors' local purchases spent in sector i.

$PREEL_i$ : Local employees' and employers' income as a percentage of sales in sector i.

Equation (22) is similar to those equations associated with parameters K2 and K3. However, the breakdown of visitors' purchases must be sought rather than the breakdown of local residents' or park's purchases. The data required for the equation regarding local firms are the same.

K5 (Proportion of local construction purchases transformed into local income)

$$K5 = \sum_{i=1}^n (PALC_i * PREEL_i), \text{ for } i = \begin{matrix} \text{type of expenditures} \\ \text{or firms} \end{matrix} \quad (23)$$

where

$PALC_i$ : Proportion of local construction material purchases spent in sector i.

$PREEL_i$ : Local employees' and employers' income as a percentage of sales in sector i.

Since we can expect local construction materials to be purchased from firms that are found in the same group within the computer program, the evaluation of K5 may be simpler.

K6 (Proportion of local firms' total receipts used to purchase local goods and services)

$$K6 = \sum_{i=1}^n (PRTE_i * PALT_i), \text{ for } i = \begin{matrix} \text{type of expenditures} \\ \text{or firms} \end{matrix} \quad (24)$$

where

$PRTE_i$ : Proportion of local firms' total receipts of sector  $i$  spent on local goods and services.

$PALT_i$ : Proportion of total local purchases by Parks Canada's employees and visitors and by Parks Canada for park operation and for construction materials, within sector  $i$ .

In order to estimate the proportion of local purchases by local firms comparatively to their total sales, the portion of local sales of each local sector  $i$  is weighted by the percentage of total expenditures effected in that sector, then the amounts thus obtained are added in.

#### 1.3.2 Providing the parameter values to the program

If it is impossible to estimate the parameters based on survey data, the user may nevertheless select values from previous studies or based on his general knowledge of the area studied. Table 2 shows the parameters used in some previous studies done for national parks.

The table shows that the values that were used vary greatly from one study to another. For parameter  $K_1$ , this might be due to differences in the local availability of goods and services and in the local residents' consumption habits. For the other parameters, the discrepancy is due primarily to the proportion of total sales of each type of firm paid out as income to local residents. However, some values, such as the figure 0.78 for  $K_1$  of the Cape Breton Highlands study, do not seem realistic. On the other hand, it appears that parameters  $K_2$ ,  $K_3$  and  $K_4$  of the Kouchibouguac, Kejimikujik and Minganie studies are far smaller than the figures shown in Table 1.

It is important that the analyst who wants to use parameter values obtained from other studies examines carefully the way in which those data were obtained, the geographic framework of the study and the economic situation prevailing at the time the parameters were computed. Nonetheless, the use of parameters derived from previous studies could be quite acceptable, provided that the user carefully selects and examines the value of those parameters.

TABLE 2

Parameters K1, K2, K3, K4, K5, K6 values  
used in some previous studies

| Studies                            | Parameters |       |       |       |    |      |                     |
|------------------------------------|------------|-------|-------|-------|----|------|---------------------|
|                                    | K1         | K2    | K3    | K4    | K5 | K6   | $1/(1-K1 \cdot K2)$ |
| Kouchibouguac<br>(1981)            | 0.70*      | 0.14  | 0.12  | 0.15  | -  | -    | 1.11                |
| Kejimikujik<br>(1976)              | 0.59       | 0.17  | 0.19  | 0.19  | -  | -    | 1.08                |
| Cape Breton<br>Highlands<br>(1980) | 0.78       | 0.30  | 0.34  | 0.36  | -  | -    | 1.31                |
| Minganie<br>(1984)                 | 0.55       | 0.14* | 0.12* | 0.12* | -  | -    | 1.09                |
| Bruce<br>Peninsula<br>(1985)       | 0.20       | 0.42  | 0.42  | 0.42  | -  | 0.08 | 1.09                |

\* Data from previous studies by Parks Canada

CHAPTER II  
COMPUTERIZATION OF THE APPROACH

This chapter deals specifically with the use of the "Tiebout" computer program and presents the main characteristics of the program. Subsequently, four work sessions are simulated to provide for an easier use of the program.

**2.1 Computer program characteristics**

The "Tiebout" program was written in BASIC and implemented on an IBM-PC computer. A second program, entitled "Support", was developed to manage the data banks pertaining to the "Tiebout" program. The "Support" program, written in WYLBUR, is user-friendly, requiring no programming knowledge by the user. It is by means of the "Support" program that the user will run the "Tiebout" program. The loading procedure of the two programs into the computer is explained in Appendix 1.

**2.1.1 Data bank management**

Since the number of data required to assess the local economic impact may exceed one hundred and eighty, it is essential to find a simple, effective means to build the data bank, to modify it and then store it. Moreover, the user will perhaps want to do several different simulations and keep the various data banks. The chosen solution to effect these various operations consisted in developing the "Support" program, which makes it possible to carry out the following operations:

- create a new data bank;
- modify an existing data bank;
- examine the contents of a data bank;
- eliminate a data bank;
- list existing data banks;
- enter a data bank.

The menu of the program, as it appears on the screen, is:

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**2.2 Selected applications**

The four examples given here differ substantially from each other. The first one uses the full capability of the program: maximum number of expenditure, visitor and construction types; it calculates the local economic impact for the maximum number of years, calls upon the program to estimate the value of the various parameters and uses the sales based approach to estimate generated employment. The second example differs from the first inasmuch as construction work is non-existent and the wage based approach is used to estimate the number of jobs created. The third example imposes to the program a value for the six parameters, involves a very limited number of types of visitors, expenditures, etc., and analyzes the economic impact for only three years. The fourth example shows an extremely limited data bank that involves only one visitor, expenditure and construction type. Moreover, it imposes the value of the parameters.

**2.2.1 First example**

Table 1 in Appendix 2 gives the data from the data bank pertaining to this example. These are dummy data not related in any way to any particular national park or historical site. The table shows that four types of visitors were identified: day visitors, those who use the campground, those staying in hotels and those who merely cross or use the park's road system. The spending behavior of these various types of visitors differs greatly from each other, hence their distinction. On the other hand, the five types of expenditures are groceries, accommodation, recreation, transportation and other expenditures. Since in this example the program computes the value of parameters K1 to K6, the value of the parameters given by the user consists of zero, whereas the non-zero data are shown for the values of items (14), (15), (19), (30), (31) and (32). Moreover, since the values of local firms' total sales and of total local firms' employment, items (26) and (29) of the data bank, are non-zero, the program uses the total sales based approach to compute the number of jobs generated.

Since the types of visitors were shown in the order "day", "camping", "hotel" and "non-users" under heading (7), all subsequent data pertaining to the various types of visitors are shown in the same order. The same applies to the types of expenditures and of construction.

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Once all the data have been entered in the nine screens, and the data bank has been entered in a permanent file, the user may run the "Tiebout" program. He must merely indicate option 3 and the name of the data bank to be processed, then press key F10. Here is what appears on the computer screen during this work session; information typed by the user is underlined.

MENU

- Options: 1: Create a new data file  
2: Edit an old data file  
3: Run program  
4: View a data file  
5: List existing data files  
6: Erase a data file  
9: Exit

3

Data name: A:TESM1

Press F10 to continue - F5 to abort

---

programme "TIEBOUT" program

---

Quelle langue désirez-vous? (What language do you want?)  
(F)rançais or (A)nglaise ((F)rench or (E)nglish) E

Good Day. This program calculates the local economic impact of a new national park or a historical site or the operation of an existing national park or a historical site.

What is today's date?  
Type the date and press return. 31/01/85

As stated previously, following "Tiebout" program identification, the user must specify the language in which he wants the results to appear. Next, there is a short description of the program. The user is then asked to give today's date, then the tables will be printed out one at a

MENU

Options: 1: Create a new data file  
2: Edit an old data file  
3: Run program  
4: View a data file  
5: List existing data files  
6: Erase a data file  
9: Exit

4

Data name: A:TESM1

Press F10 to continue - F5 to abort

In the case shown, the user chose to examine the contents of a data bank (option 4) called TЕСM1 on diskette A. Data entry on the screen by the user (in this case, the terms "4" and "A:TESM1") is done by means of the various positioning keys "←", "→", "↑", "↓", or the TAB key that advances the cursor from one box to another. It should be mentioned here that the program is designed to ensure that the user completes only the boxes clearly identified on the screen. He may also modify the data he entered by using the positioning keys and the TAB key. Once he has typed his commands, he presses F10 for the command to be entered into the program, or F5 to cancel it.

In order to build a data bank, the user must complete nine different screens. In addition to the boxes reserved for the values, those screens contain the titles and numbers of the various data bank headings. Once he has completed a screen, the user advances to the next screen by pressing key F10. Once screen number 9 has been completed and key F10 has been pressed, the program asks under what name the file is to be saved. The program then returns to the menu. The user may interrupt the creation of a data bank at any time by means of key F5. The program then asks him whether he wants to stop the work. If the user says "NO", command F5 is ignored. Otherwise, he will lose the data he has just entered into the program and will return to the menu. Key F5 may be used with the other options.

When a user who wants to examine the contents of a file gives a non-existent file name, the error message "data file not found" appears at the bottom of the screen once key F10 has

been pressed. At the same time, the menu returns to the screen. The same message appears with options 2 and 6 if the user specifies a non-existent file name. On the other hand, if he wants to enter a non-existent file, the error message appears at the top of the screen and the menu then returns.

In order to erase a file the user selects option 6, as well as the location and name of the file, for example, A:TESM1. The program then indicates at the bottom of the screen that the file has been eliminated and the menu reappears on the screen. It is feasible to eliminate a file located in either one of floppy disk drive A or B.

When the user indicates that he wants to know what the existing files are, the program checks which data banks have been built with its assistance. If a file named TEST.BAS was created by another program and is on diskette A, the "Support" program will not indicate that file. If the computer has two disk drives, both will be scanned. The file names are accompanied by the letter A or B designating the disk drive. To return to the menu once the files have been listed, the user must press key "←".

Finally, a user who wants to modify a data bank must run through the entire data bank. Thus, if he wants to change the value of heading (2) of the data bank, he will not be able to get out of the edit option before reaching the end of the file. The program then asks him under what name he wants to keep his new file. If he specifies a file name that already exists, the program points this out to him and asks him whether he wants to replace the existing file with the one he has just modified. The menu then reappears on the screen.

#### 2.1.2 Data bank

Table 3 shows the data included in a data bank as well as the order in which they appear in the "Support" program. The table holds thirty-two different types of data. It is not always necessary for the data to be non-zero, nor for the user to know the data. In some cases, the user has very little information but can nevertheless run the "Tiebout" program. In the four examples below, the quantity of non-zero data varies considerably from one example to another. Examination of these examples will give the user a true understanding of how the data bank should be structured.

When the user develops a data bank, he must specify the number of visitor, expenditure and construction types to be included in the analysis. This is done at locations (5), (6) and (16) in the data bank. At the very most, four, four and five types, respectively, can be specified. In regard to the years to be analysed, the user must specify at locations (3) and (4) the first year and the total number of years to be analyzed. At the most, ten years can be studied. Once the program has been supplied with this information, it can prepare the data bank formats accordingly. For instance, if the user specifies that he only wants to analyse three years, he will only be able to identify in the program the number of visitors for three years; there will be no space available for data concerning additional years.

The various visitor, expenditure and construction types identified at locations (7), (9) and (17) are supplied by the user. However, none of these terms may exceed fourteen spaces. If that limit is exceeded, the word involved will be truncated down to fourteen letters in the result tables.

Several comments must be made regarding various headings in Table 3. These comments make it easier to understand the scope, meaning and content of the data required for estimating the economic impact.

- The most important remark concerns purchases related to operation and construction. The definition of operating expenses used in this report is not necessarily the one used within the Parks Canada financial system. In the latter, amounts allotted to the purchase of lawn mowers, automobiles or furniture may be included in the investment budget. In an economic impact study, those amounts must be included among operating expenses. In fact, any amount that is not used for the construction or repair of buildings, the development of sites and walkways, etc., must be included among operating expenses.
- The purchase of services such as beach surveillance, garbage removal, etc., which are obviously linked to the operating budget, can be included in the analysis in two different ways. They can be considered under heading (11) of the data bank, in which case, one of the expenditure types specified in item (7) of the data bank must be "professional services". The amounts pertaining to this type will then be

**TABLE 3**

**Information contained in the data bank**

| Order of appearance | Information                                                                                                                                  |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 1°                  | Name of the park or the site to be studied                                                                                                   |
| 2°                  | Option analyzed                                                                                                                              |
| 3°                  | First year to be analyzed                                                                                                                    |
| 4°                  | Number of years to be analyzed                                                                                                               |
| 5°                  | Number of types of visitors                                                                                                                  |
| 6°                  | Number of types of expenditures                                                                                                              |
| 7°                  | Types of visitors                                                                                                                            |
| 8°                  | Number of visitor-days, by type of visitor, for each year                                                                                    |
| 9°                  | Types of expenditures                                                                                                                        |
| 10°                 | Daily local expenditures of the various types of visitors, for each type of expenditures                                                     |
| 11°                 | Purchases of local goods and services by Parks Canada for park or site operation, by year                                                    |
| 12°                 | Parks Canada local wage and salary payments for park or site operation, by year                                                              |
| 13°                 | Number of local person-years directly associated with park or site operation, by year                                                        |
| 14°                 | Purchases of local goods and services by Parks Canada for park or site operation, by type of expenditures, for the first year to be analyzed |
| 15°                 | Local residents' total purchases of local goods and services, by type of expenditures, for the first year to be analyzed                     |
| 16°                 | Number of construction types                                                                                                                 |
| 17°                 | Types of construction                                                                                                                        |
| 18°                 | Construction expenditures, by type of construction, by year                                                                                  |

TABLE 3 (continued)

## Information contained in the data bank

| Order of appearance | Information                                                                                                                                         |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 19°                 | Distribution of local construction material purchases, by type of expenditures, for the first year to be analyzed                                   |
| 20°                 | Wages and salaries (after profit and overhead) in the construction industry, per purchase dollar, by type of construction                           |
| 21°                 | Purchases of local materials by the construction industry, by purchase dollar (after wages, salaries, profit and overhead), by type of construction |
| 22°                 | Construction industry profit and overhead, per purchase dollar                                                                                      |
| 23°                 | Proportion of construction wages and salaries paid to local residents                                                                               |
| 24°                 | Weekly wages and salaries in the construction industry                                                                                              |
| 25°                 | Value of the various coefficients K1, K2, K3, K4, K5, K6                                                                                            |
| 26°                 | Total sales of local firms, for the first year to be analyzed                                                                                       |
| 27°                 | Proportion by which local sales must increase in order to create one job                                                                            |
| 28°                 | Average weekly wage in local firms, for the first year to be analyzed                                                                               |
| 29°                 | Total employment by local firms, in person-years, for the first year to be analyzed                                                                 |
| 30°                 | Local residents' total income, for the first year to be analyzed                                                                                    |
| 31°                 | Income of local employees and employers, per purchase dollar, by type of expenditures, for the first year to be analyzed                            |
| 32°                 | Proportion of local firms' sales used to purchase local goods and services, by type of expenditures, for the first year to be analyzed              |

specified under "professional services" in item (14). In this way, the specific nature of this type of service will be recognized. Indeed, it is a known fact that the wage content of this type of purchase is particularly high. The second way to treat these expenses is to single out from the outset the wage component included in service contracts. That wage component is later incorporated into the Parks Canada wage and salary payments to its local employees under heading (12). As a result, the number of local employees directly associated with the operation of the park must be adjusted. The goods and services component included in service contracts must then be treated like any other goods purchased by Parks Canada. This procedure implies that the service firms' employees attached to the park are considered to be park related employees, similarly to regular park employees or construction employees. This is the only notable difference between the two approaches. In both cases, the jobs created constitute direct employment.

- Constraints have been imposed for certain elements of the data bank. The values of items (19), (20), (21), (22), (23), (25), (31) and (32) for instance must all be less than or equal to one. The "Support" program accepts no value greater than one. If a data that fails to meet this constraint is typed, an error message appears once the user has pressed key F10. At the same time, the faulty screen reappears and the cursor is positioned at the data to be corrected. The user cannot move on to the next screen without first correcting that data. A similar check is applied to item (14). If the user decides to specify non-zero values under that heading, the sum of the park's local purchases for operating purposes for the first year, that is the sum of the data under heading (14), must equal the first data under heading (11), i.e. the park's total local purchases for operating purposes for the first year. If that constraint is violated, an error message will appear. The total of heading (14) and the first value of heading (11) will also be indicated. Once again, the user may not advance to the next screen without first correcting heading (14).
- On the other hand, the value under heading (27), that is the proportion by which local sales must increase in order to create one job, will be one if, upon a doubling of sales, the number of jobs created is equal to the number of existing jobs. A value greater than one, for instance 1.30 means that the amount of sales must be increased by 130 percent in

order to double employment, i.e. the workers of local firms are under-utilized. Conversely, a value less than one indicates that local workers are over-utilized.

- It should be stressed that weekly wages and salaries in the construction industry and local firms, (headings 24 and 28), must correspond to the gross wage rather than to the net wage. They must include only amounts paid out directly to workers. The same is true for wages and salaries paid out by Parks Canada. Along the same lines, parameter K1 (the average propensity to consume) must take into account the amounts paid out in taxes. On the other hand, the total income of local residents (item 30), must include income from pensions, interest, investments, unemployment insurance benefits, etc. Ideally, the average weekly wage should be estimated taking into account the remuneration of owners and managers, and by excluding the overhead and amounts related to past and future investment.
- Total employment within local firms (item 29), includes all local firms' employees and employers. The employees of various levels of government and non-profit organizations must not be included. Total employment must be expressed in terms of person-years rather than in terms of individuals. This last remark applies also to heading (13), namely, the number of jobs connected with operating expenditures.
- It should be pointed out that the statistics concerning purchases and the wages and salaries of employees connected with the operation of the park or the site, headings (11), (12), (13) and (14), are those associated with the local area. One must therefore expect, for instance, that the total purchases of goods and services for operating purposes will exceed the purchases of goods and services that appear in the data bank.
- Several data included in the data bank must be broken down by type of expenditures, for instance in the case of headings (10), (14), (15), (19), (31) and (32). The types of expenditures are directly related to types of firms; there is no dichotomy between these two groups. "Grocery" expenditures are thus incurred by purchasing from a firm type called "grocery".
- Item 32, i.e. the proportion of firms' total sales used to purchase local goods and services, reflects to some extent

the degree of development and integration of the local economy. A value of 0.10 for example for the "accommodation" type of expenditures means that local purchases of the "accommodation" firm represents only 10% of their sales or receipts.

- The proportion of construction wages and salaries paid to local residents, heading (23), may include amounts given to construction employees who will settle in the area for the duration of the construction work and who will spend their earnings in the area itself. When the proportion of local wages and salaries is not available, the user may resort, for an approximation, to the percentage of construction employment originating from the area.
- A value of 0.40 for wages and salaries at heading (20) means that once profits and overhead expenses are deducted, 40% of the amount left over is allocated to employees and 60% allocated to buy construction materials. This percentage is therefore applied to a purchase dollar excluding profits and overhead expenses. Similarly, a value of 0.40 for purchasing local construction material, heading (21), indicates that 40% of the purchase of construction material comes from the area.
- Finally, construction expenditures in item (18) must include all public construction works undertaken in the park or the site, i.e. those of Parks Canada or of the Department of Public Works as well as those done by construction firms for Parks Canada. Items (18), (20) and (21) are broken down by types of construction because the manpower and materials ratio often varies from one type of construction to another. Thus, construction of campgrounds or trails will require proportionately much more manpower than the construction of a road. Inasmuch as the user does not differentiate between the percentage of manpower and materials by type of construction under headings (20) and (21), he may consider only one type of construction.

Completing a data bank may take up to 30 minutes if the user specifies the maximum number of years, of visitors, of expenditures and of construction types. To do so, the user must complete nine screens. Table 1 in Appendix 2 shows these nine screens. The data included in these are those provided by the user. The data bank shown here uses the maximum number of years, of visitors, of expenditures and of construction types. Similarly to the selection of the option desired,

desired, data entry on these screens is done by means of the positioning keys and of the TAB key.

If the project or option under study comprises no construction work, the user must nevertheless specify a construction type that will be known as "total". He must then assign nil values to all data bank elements that pertain to construction, i.e. components (18), (19), (20), (21), (22), (23) and (24). The example in section 2.2.2 shows an impact study in which no construction expenditures are considered.

All the information contained in the data bank appears in the various result tables. Table 4 shows the location of each data bank element in the various tables printed out after running the "Tiebout" program. By means of that table, the user can readily check the value of the various data and parameters associated with the park or the site. Similarly, he can later easily identify the parameters that led to a given result.

#### 2.1.3 Estimating parameters K1, K2, K3, K4, K5, K6 and the number of jobs

As previously stated, the user may calculate the value of the parameters or impose to the program values of his choice. Selection of the approach is very simple; if the user wants to provide parameter values to the program, all he has to do is specify non-zero values for the parameters in the data bank. It should be recalled that these values appear in the 25th position in the data bank. Otherwise, he must specify zero values for each parameter. The data which are only required for the calculation of parameters by the program are:

- (14) Purchases of local goods and services by Parks Canada for park or site operation, by type of expenditures, for the first year to be analyzed.
- (15) Local residents' total purchases of local goods and services, by type of expenditures, for the first year to be analyzed.
- (19) Distribution of local construction material purchases, by type of expenditures, for the first year to be analyzed.
- (30) Local residents' total income, for the first year to be analyzed.

**TABLE 4**

**Correspondence between the data bank and the result tables**

| Data bank<br>elements | Location in the result tables |
|-----------------------|-------------------------------|
| 1                     | Heading                       |
| 2                     | All tables                    |
| 3                     | All tables                    |
| 4                     | Parameter in the tables       |
| 5                     | Parameter in the tables       |
| 6                     | Parameter in the tables       |
| 7                     | (1), (2), (3)                 |
| 8                     | (1)                           |
| 9                     | (2), (4), (6), (8), (10)      |
| 10                    | (2)                           |
| 11                    | (5)                           |
| 12                    | (5)                           |
| 13                    | (15)                          |
| 14                    | (6)                           |
| 15                    | (10)                          |
| 16                    | Parameter in the tables       |
| 17                    | (7), (8)                      |
| 18                    | (7)                           |
| 19                    | (8)                           |
| 20                    | (8)                           |
| 21                    | (8)                           |
| 22                    | (8)                           |
| 23                    | (8)                           |
| 24                    | (8)                           |
| 25                    | (11)                          |
| 26                    | (10)                          |
| 27                    | (10)                          |
| 28                    | (10)                          |
| 29                    | (10)                          |
| 30                    | (10)                          |
| 31                    | (10)                          |
| 32                    | (10)                          |

- (31) Income of local employees and employers, per purchase dollar, by type of expenditures, for the first year to be analyzed.
- (32) Proportion of local firms' sales used to purchase local goods and services, by type of expenditures, for the first year to be analyzed.

When the user imposes parameter values to the program, he must assign zero values to each of these data. On the other hand, the user may have the program calculate certain parameters and impose his choice for the others, in which case he must devote particular attention to the data that are not nil. The following data must be positive for the calculation of parameters by the program:

- (15) and (30) for K1
- (15) and (31) for K2
- (14) and (31) for K3
- (31) for K4
- (19) and (31) for K5
- (14), (15), (19), (31) and (32) for K6

Whichever approach is retained, the user can always check which value the program has assigned to each parameter by referring to result table number eleven.

In regard to the selection of the approach for estimating the employment generated, the method is the same as for parameters K1 to K6. If the user specifies under headings (26) and (29) non-zero values for total sales and the number of local firms' employees, the program will use the sales based estimation approach. Otherwise, it will use the wage based approach.

#### 2.1.4 Result tables

Result tables are printed out as the "Tiebout" program executes the commands. As mentioned earlier, in addition to the results, they comprise the totality of the data entered by the user. Seventeen tables are produced. Divided into six groups, the tables are:

Group 1: Table 1 to 4: Number of visitors and visitors' expenditures

- Group 2: Tables 5 and 6: Parks Canada operating expenditures
- Group 3: Tables 7 to 9: Construction expenditures and local construction industry characteristics
- Group 4: Tables 10 and 11: Data required for calculating the parameters and the parameter values
- Group 5: Tables 12 to 14: Local income impact
- Group 6: Tables 15 to 17: Local employment impact

The final results of the economic impact analysis are found in Tables 12 to 17. In the previous tables, and to some extent in Table 15, the data included in the data bank are side by side with some compilations effected by the program.

Table 12 in fact consists of two sub-tables. The first one, 12A, shows the income effect of the first year of the study, while Table 12B shows the income effect associated with the last year of analysis. To obtain the income effect for all years studied, one must refer to Table 13. The presentation is identical in both tables. The direct, indirect, induced and total effects are shown for each type of expenditures, i.e. visitors' expenditures, operating and construction expenditures, and total expenditures. Table 14 presents a summary showing for each study year and for the whole duration of the analysis, the direct, indirect and induced impact and the totals related to the overall expenditures having to do with the park or the site.

In regard to the employment impact, Table 15 shows the number of jobs connected with the park or the site operation and construction for each study year and for all study years together. This does not include the jobs related to purchases of goods and services for construction and operation purposes, nor visitors' purchases. Table 16, in turn, shows the various types of direct, indirect, induced and total effects for the entire project duration, per each impact source. The structure of this table is similar to the structure of Table 13. Table 17 gives direct, indirect and induced impacts and totals of employment for each year of study and for the entire length of the project. The results reported in Table 14 to 17 are all in terms of person-years.

time. Once the last table has been printed, the following message appears:

The program is over.

The menu comprising of the seven work options then appears on the monitor and the user may terminate the session or carry out other operations. The result tables associated with this example will be presented in Table 2 in Appendix 2. It should be recalled that all the data included in the data bank are shown in these tables which reflect maximum use of the program.

### 2.2.2 Second example

It may happen that there have been no construction expenditures in a park or a site over the period studied. Moreover, it should be expected that in several studies the local firms' total sales data are not available, although wage data are available. The following example presents such a case. These are the major differences between this example and the previous one. On the other hand, there are no in transit types of visitors in this example. The types of visitors identified are day visitors, those who use campgrounds and those staying in hotels. The data bank pertaining to this example is shown in Table 3 in Appendix 2. The data pertaining to construction work and to this industry, which are grouped together on screens (7) and (8), are all nil. Only one type of construction was considered and its name is "total".

In regard to the results, Tables 1 to 6 are similar to those in example 1, whereas Tables 7, 8 and 9 and the local firms' total sales and employment data in Table 10 are marked "not available". In Table 11, the value of the parameter associated with construction expenditures (K5) is zero. As for economic impact Tables 12 to 17, they only show the impact generated by site operation and by visitors. The tables pertaining to this example are shown in Table 4 in Appendix 2.

### 2.2.3 Third example

Since the resources required for calculating parameters K1 to K6 and estimating local firms' total sales are seldom available, the most common use of the "Tiebout" program will probably involve imposing to the program values for these parameters and using a relatively limited data bank. The

example below indeed fits this description; it includes only forty-four positive statistical data.

The data comprised in the data bank of this example are shown in Table 5 in Appendix 2. As before, the statistics in that table are dummy data. In this case, three years are studied, no distinction is made between types of visitors and types of construction, but four types of expenditures are considered. The data associated with parameters K1 to K6 are 0.62, 0.28, 0.26, 0.29, 0.30 and 0.11, respectively, and can be found under heading (25) of the data bank. As a result, the values required for computing the parameters and the values associated with items (14), (15), (19), (30), (31) and (32) are nil. The average weekly wage in local firms was set at 120 dollars, while total sales and total employment were set to zero.

The results of this simulation are shown in Table 6 of Appendix 2. Since the number of non-zero data in the data bank is much less than in the previous example, the result tables are less detailed and several "not available" remarks appear in Tables 6, 8 and 10. It is interesting to note that the "tourist services" type has more than fourteen letters and has therefore been truncated in the data bank and appears as follows in the table: "Tourist Serv.".

#### 2.2.4 Fourth example

As already mentioned in section 2.2, example number four is by far the simplest. It does not differentiate types of visitors, nor types of construction work nor types of expenditures. This point constitutes the only difference with example 3. Moreover, it only takes into account three study years and imposes to the program the value of the six parameters. Table 7 in Appendix 2 shows the data bank pertaining to this example.

A comparison between this table and that of the previous example shows that the only truly different data are under headings (7) and (9). On the other hand, the nil data under headings (14), (15), (19), (31) and (32) go from four zeros to one zero because the number of expenditure types goes from four to one.

In regard to the results shown in Table 8 in Appendix 2, the only difference relative to the previous examples involves Tables 2 and 4 which are reduced to their simplest form. The income and employment generated, shown in Tables 12 and subsequent, are also similar to those in the previous example.



## CONCLUSION

Computerization of the "Tiebout" model will no doubt enable analysts to save valuable time in estimating the local economic impact of a national park or a historical site. Indeed, by means of the program, the economic impact of the operation and construction of any park or site can be quickly estimated, as well as the visitor related economic impact. Moreover, the variables estimated by this economic impact model are not complex concepts.

The data bank is undoubtedly the most important element of the program and must be created in accordance with strict standards; the data must be ordered in accordance with a pre-established rule. In this respect, the various practical examples given in Chapter 2 make it easier to grasp the operation of the data bank management program. Use of this program is very simple and requires no knowledge of the BASIC and WYLBUR computer languages.

However, one must be aware of the numerous constraints and limitations of this type of model. The major constraint is undoubtedly related to the geographic framework. Indeed, parameters K1 to K6 must be estimated within the same geographic framework as the data pertaining to operating and visitor expenditures. Another limitation of the model involves the evaluation of income and employment. On this point, the model only takes into account labor income and completely ignores transfer payments such as unemployment insurance. It therefore underestimates the income generated and the jobs created when the direct, indirect and induced jobs created are temporary or part-time. In regard to investment expenditures, this model does not estimate the impact that an increase in local firms' sales may have on their expansion plan. These investments could involve the use of local manpower and construction materials, for instance.

On the other hand, there is no estimate of the impact upon municipal finance and other government revenue, nor of the impact on the park or the site generated increase in local production. In fact, the contribution of the site is not highlighted with the structure of the local economy in terms of housing, wages and salaries, employment, labor force, etc. It is therefore impossible to tell whether the jobs created will be filled locally or by workers from elsewhere. As a result, the economic impact is somewhat vague and the results of the program should not be interpreted as a complete

assessment of the local economic impact, but rather as a small fraction of all the economic data that must be estimated in an economic impact study.

Finally, although it identifies significant impacts on various aggregates, this type of analysis does not indicate the economic performance of Parks Canada's operating and investment expenditures. To do so, one should, for example, compare the impact of those expenditures to that of different projects, whether in the private or public sector. Similarly, an economic impact study for an investment project should not be mistaken for a social profitability study, which is a matter for cost-benefit analysis.

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APPENDIX 1  
PROCEDURE TO LOAD  
THE LOCAL ECONOMIC IMPACT MODEL

## A1.1

The Local Economic Impact Model has been adapted for use with the IBM-PC and its compatibles. It requires 190k minimum of random-access memory to operate, a printer capable of printing reports of up to 80 columns and a disk drive. The user must also have a copy of the On Line WYLBUR Help Software which can be purchased through the COMTEK Company. This software can be stored on the floppy disk containing the Local Economic Impact Model or on a second disk. The loading procedure, if the user has two floppy disks, is as follows:

- 1) Insert the floppy disk containing the Local Economic Impact Model in drive A.
- 2) Turn on the computer, screen and printer.
- 3) Press "RETURN" key when the computer asks for the date and time.
- 4) When A appears on the screen, take out the floppy disk containing the Local Economic Impact Model from drive A.
- 5) Insert the floppy disk containing the On Line WYLBUR Help Software into drive A.
- 6) Type WYLBUR and press "RETURN"
- 7) When COMMAND appears on the screen, take the On Line WYLBUR Help Software floppy disk out of drive A.
- 8) Reinsert the floppy disk containing the Local Economic Impact Model in drive A.
- 9) Type EXEC FRO PREBAS and press "RETURN".

After a few seconds, the menu will appear as is demonstrated in Section 2.1.1 of this report. The user can now begin a work session.

There are some programs that can help simplify this procedure. For example, in putting the On Line WYLBUR Help Software on the Local Economic Impact Model floppy disk will enable the user to reduce the loading procedure to steps 1 and 2.

**APPENDIX 2**  
**DATA BANK AND RESULT TABLES**  
**FOR EXAMPLES 1 TO 4**

**TABLE 1**  
**Data bank for example 1**

**Screen 1      GENERAL INFORMATION**

(1) Name of park/site    MINGANIE NATIONAL PARK  
 (2) Option analyzed      1  
 (3) First year to be analyzed      1985  
 (4) Number of years to be analyzed    10    maximum 10  
 (5) Number of types of visitors      4    maximum 4  
 (6) Number of types of expenditures    5    maximum 5

Press F10 to continue - F5 to abort

**Screen 2                    (8) NUMBER OF VISITOR-DAYS**

**(7) Types of visitors**

|      | DAY USERS | CAMPING | HOTEL | WON USERS |
|------|-----------|---------|-------|-----------|
| 1985 | 1200      | 2000    | 1700  | 500       |
| 1986 | 1250      | 2050    | 1750  | 510       |
| 1987 | 1300      | 2100    | 1800  | 520       |
| 1988 | 1350      | 2150    | 1850  | 530       |
| 1989 | 1400      | 2200    | 1900  | 540       |
| 1990 | 1450      | 2250    | 1950  | 550       |
| 1991 | 1500      | 2300    | 2000  | 560       |
| 1992 | 1550      | 2350    | 2050  | 570       |
| 1993 | 1600      | 2400    | 2100  | 580       |
| 1994 | 1650      | 2450    | 2150  | 590       |

Press F10 to continue - F5 to abort

TABLE 1 (continued)  
Data bank for example 1

Screen 3 (10) DAILY LOCAL EXPENDITURE OF VISITORS

| (9) Types of expenditures | Types of visitors |         |       |           |
|---------------------------|-------------------|---------|-------|-----------|
|                           | DAY USERS         | CAMPING | HOTEL | NON USERS |
| GROCERY                   | 3.00              | 5.00    | 4.00  | 0.00      |
| ACCOMODATIONS             | 3.00              | 2.00    | 20.00 | 0.00      |
| RECREATION                | 3.00              | 2.00    | 4.00  | 0.00      |
| TRANSPORT                 | 4.00              | 4.00    | 6.00  | 6.00      |
| OTHERS                    | 2.00              | 2.50    | 3.00  | 0.00      |

Press F10 to continue - F5 to abort

Screen 4

11: Operation expenditures of local goods and services by the park/site  
12: Local wages and salaries paid for operation of park/site  
13: Number of local p.y.'s directly associated with operation of park/site

|      | *** 11 *** | *** 12 *** | *** 13 *** |
|------|------------|------------|------------|
| 1985 | 27300      | 300000     | 99         |
| 1986 | 27400      | 310000     | 104        |
| 1987 | 27500      | 320000     | 109        |
| 1988 | 27600      | 330000     | 114        |
| 1989 | 27700      | 340000     | 120        |
| 1990 | 27800      | 350000     | 126        |
| 1991 | 27900      | 360000     | 133        |
| 1992 | 28000      | 370000     | 139        |
| 1993 | 28100      | 380000     | 146        |
| 1994 | 28200      | 390000     | 154        |

Press F10 to continue - F5 to abort

TABLE 1  
Data bank for example 1

Screen 5

14: Operation expend. of local goods and services by the park/site in 1985

15: Local goods and services purchased by local residents in 1985

|               | *** 14 *** | *** 15 *** |
|---------------|------------|------------|
| GROCERY       | 7100       | 495000     |
| ACCOMODATIONS | 4100       | 18500      |
| RECREATION    | 12700      | 31000      |
| TRANSPORT     | 1400       | 313500     |
| OTHERS        | 2000       | 250000     |

Press F10 to continue - F5 to abort

Screen 6

(16) Number of construction categories

4      maximum 4

Press F10 to continue - F5 to abort

TABLE 1 (continued)  
Data bank for example 1

Screen 7

(18) CONSTRUCTION EXPENDITURES

(17) Categories of construction

|      | CAMP/TRAILS | BUILDINGS | ROADS/DOCKS | OTHERS |
|------|-------------|-----------|-------------|--------|
| 1985 | 0           | 50000     | 200000      | 50000  |
| 1986 | 20000       | 100000    | 100000      | 75000  |
| 1987 | 60000       | 300000    | 100000      | 60000  |
| 1988 | 100000      | 200000    | 100000      | 100000 |
| 1989 | 80000       | 100000    | 50000       | 50000  |
| 1990 | 50000       | 50000     | 0           | 50000  |
| 1991 | 50000       | 25000     | 0           | 50000  |
| 1992 | 0           | 0         | 0           | 50000  |
| 1993 | 0           | 0         | 0           | 50000  |
| 1994 | 0           | 0         | 0           | 50000  |

Press F10 to continue - F5 to abort

Screen 8

(19) Distribution of purchases of local const. materials in 1985

| GROCERY | ACCOMMODATIONS | LEASURE | TRANSPORT | OTHERS |
|---------|----------------|---------|-----------|--------|
| .05     | .05            | 0.00    | .10       | .80    |

(20) Wages and salaries per dollar of construction  
(less profits and overhead)

| CAMP/TRAILS | BUILDINGS | ROADS/DOCKS | OTHERS |
|-------------|-----------|-------------|--------|
| .70         | .35       | .15         | .40    |

(21) Local material purchase per dollar of construction  
(less profits, overhead, salaries and wages)

| CAMP/TRAILS | BUILDINGS | ROADS/DOCKS | OTHERS |
|-------------|-----------|-------------|--------|
| .80         | .70       | .50         | .60    |

(22) Profits and overhead per dollar of construction .13

(23) % of construction wages paid in the region .50

(24) Weekly wage and salary in construction ind. in 1985 520.00

Press F10 to continue - F5 to abort

TABLE 1  
Data bank for example 1

Screen 9

|      |                                                              |               |            |           |        |         |
|------|--------------------------------------------------------------|---------------|------------|-----------|--------|---------|
| (25) | K1                                                           | K2            | K3         | K4        | K5     | K6      |
|      | 0.00                                                         | 0.00          | 0.00       | 0.00      | 0.00   | 0.00    |
| (26) | Total sales of local firms in 1985                           |               |            |           |        | 1500000 |
| (27) | 1 local sales must increase to create one job in 1985        |               |            |           |        | 1.30    |
| (28) | Weekly average salaries in local firms in 1985               |               |            |           |        | 120.00  |
| (29) | Total local firms p.y.'s in 1985                             |               |            |           |        | 50      |
| (30) | Local residents' total income in 1985                        |               |            |           |        | 1800000 |
| (31) | Local employees and employers income per purchase \$ in 1985 |               |            |           |        |         |
|      | GROCERY                                                      | ACCOMODATIONS | RECREATION | TRANSPORT | OTHERS |         |
|      | .30                                                          | .35           | .20        | .25       | .30    |         |
| (32) | Ratio of firms' local purchases to total sales in 1985       |               |            |           |        |         |
|      | GROCERY                                                      | ACCOMODATIONS | LEASURE    | TRANSPORT | OTHERS |         |
|      | .10                                                          | .25           | .15        | .10       | .15    |         |

TABLE 2

Result tables for example 1

TABLE 1: NUMBERS OF VISITOR-DAYS, BY TYPE OF VISITOR  
(OPTION 1)

| YEARS | TYPES OF VISITORS |         |       |           | TOTAL |
|-------|-------------------|---------|-------|-----------|-------|
|       | DAY USERS         | CAMPING | HOTEL | NON USERS |       |
| 1985  | 1,200             | 2,000   | 1,700 | 500       | 5,400 |
| 1986  | 1,250             | 2,050   | 1,750 | 510       | 5,560 |
| 1987  | 1,300             | 2,100   | 1,800 | 520       | 5,720 |
| 1988  | 1,350             | 2,150   | 1,850 | 530       | 5,880 |
| 1989  | 1,400             | 2,200   | 1,900 | 540       | 6,040 |
| 1990  | 1,450             | 2,250   | 1,950 | 550       | 6,200 |
| 1991  | 1,500             | 2,300   | 2,000 | 560       | 6,360 |
| 1992  | 1,550             | 2,350   | 2,050 | 570       | 6,520 |
| 1993  | 1,600             | 2,400   | 2,100 | 580       | 6,680 |
| 1994  | 1,650             | 2,450   | 2,150 | 590       | 6,840 |

TABLE 2: DAILY VISITOR LOCAL EXPENDITURES  
(OPTION 1), (\$ 1985)

| TYPES OF EXPENDITURE | TYPES OF VISITORS |         |         |           |
|----------------------|-------------------|---------|---------|-----------|
|                      | DAY USERS         | CAMPING | HOTEL   | NON USERS |
| GROCERY              | \$3.00            | \$5.00  | \$4.00  | \$0.00    |
| ACCOMODATIONS        | \$3.00            | \$2.00  | \$20.00 | \$0.00    |
| RECREATION           | \$3.00            | \$2.00  | \$4.00  | \$0.00    |
| TRANSPORT            | \$6.00            | \$6.00  | \$6.00  | \$6.00    |
| OTHERS               | \$2.00            | \$2.50  | \$3.00  | \$0.00    |
| TOTAL                | \$17.00           | \$17.50 | \$37.00 | \$6.00    |

TABLE 2 ( continued )  
Result tables for example 1

TABLE 3: VISITOR LOCAL EXPENDITURES, BY TYPE OF VISITOR  
(OPTION 1 ), ( \$ 1985 )

| YEARS | TYPES OF VISITORS |          |          |           | TOTAL     |
|-------|-------------------|----------|----------|-----------|-----------|
|       | DAY USERS         | CAMPING  | MOTEL    | NON USERS |           |
| 1985  | \$20,400          | \$35,000 | \$62,900 | \$3,000   | \$121,300 |
| 1986  | \$21,250          | \$35,875 | \$64,750 | \$3,060   | \$124,935 |
| 1987  | \$22,100          | \$36,750 | \$66,600 | \$3,120   | \$128,570 |
| 1988  | \$22,950          | \$37,625 | \$68,450 | \$3,180   | \$132,205 |
| 1989  | \$23,800          | \$38,500 | \$70,300 | \$3,240   | \$135,840 |
| 1990  | \$24,650          | \$39,375 | \$72,150 | \$3,300   | \$139,475 |
| 1991  | \$25,500          | \$40,250 | \$74,000 | \$3,360   | \$143,110 |
| 1992  | \$26,350          | \$41,125 | \$75,850 | \$3,420   | \$146,745 |
| 1993  | \$27,200          | \$42,000 | \$77,700 | \$3,480   | \$150,380 |
| 1994  | \$28,050          | \$42,875 | \$79,550 | \$3,540   | \$154,015 |

TABLE 4: VISITOR LOCAL EXPENDITURES, BY TYPE OF EXPENDITURE  
(OPTION 1 ), ( \$ 1985 )

| YEARS | TYPES OF EXPENDITURES |            |           |           | TOTAL      |
|-------|-----------------------|------------|-----------|-----------|------------|
|       | GROCERY ACCOMODATIONS | RECREATION | TRANSPORT | OTHERS    |            |
| 1985  | \$20,400              | \$41,600   | \$14,400  | \$32,400  | \$121,500  |
| 1986  | \$21,000              | \$42,850   | \$14,850  | \$33,360  | \$122,060  |
| 1987  | \$21,600              | \$44,100   | \$15,300  | \$34,320  | \$125,320  |
| 1988  | \$22,200              | \$45,350   | \$15,750  | \$35,280  | \$128,580  |
| 1989  | \$22,800              | \$46,600   | \$16,200  | \$36,240  | \$131,840  |
| 1990  | \$23,400              | \$47,850   | \$16,650  | \$37,200  | \$135,100  |
| 1991  | \$24,000              | \$49,100   | \$17,100  | \$38,160  | \$138,360  |
| 1992  | \$24,600              | \$50,350   | \$17,550  | \$39,120  | \$141,620  |
| 1993  | \$25,200              | \$51,600   | \$18,000  | \$40,080  | \$144,880  |
| 1994  | \$25,800              | \$52,850   | \$18,450  | \$41,040  | \$148,140  |
| TOTAL | \$231,000             | \$472,250  | \$164,250 | \$367,200 | \$1411,875 |

TABLE 2 (continued)  
Result tables for example 1

TABLE 5: PARKS CANADA OPERATING EXPENDITURES MADE LOCALLY  
(OPTION 1 ), (\$ 1985 )

| <u>YEARS</u> | <u>LOCAL GOODS<br/>AND SERVICES</u> | <u>WAGE BILL TO<br/>LOCAL EMPLOYEES</u> | <u>TOTAL</u> |
|--------------|-------------------------------------|-----------------------------------------|--------------|
| 1985         | \$27,300                            | \$300,000                               | \$327,300    |
| 1986         | \$27,400                            | \$310,000                               | \$337,400    |
| 1987         | \$27,500                            | \$320,000                               | \$347,500    |
| 1988         | \$27,600                            | \$330,000                               | \$357,600    |
| 1989         | \$27,700                            | \$340,000                               | \$367,700    |
| 1990         | \$27,800                            | \$350,000                               | \$377,800    |
| 1991         | \$27,900                            | \$360,000                               | \$387,900    |
| 1992         | \$28,000                            | \$370,000                               | \$398,000    |
| 1993         | \$28,100                            | \$380,000                               | \$408,100    |
| 1994         | \$28,200                            | \$390,000                               | \$418,200    |

TABLE 6: PARKS CANADA OPERATION EXPENDITURES ON LOCAL GOODS AND SERVICES  
BY TYPE OF EXPENDITURE  
(OPTION 1 ), (\$ 1985 )

| <u>YEARS</u> | <u>TYPES OF EXPENDITURES</u> |                       |                   |                  |               |
|--------------|------------------------------|-----------------------|-------------------|------------------|---------------|
|              | <u>GROCERY</u>               | <u>ACCOMMODATIONS</u> | <u>RECREATION</u> | <u>TRANSPORT</u> | <u>OTHERS</u> |
| 1985         | \$7,100                      | \$4,100               | \$12,700          | \$1,400          | \$2,000       |

TABLE 7: PARKS CANADA CONSTRUCTION EXPENDITURES,  
BY TYPE OF CONSTRUCTION  
(OPTION 1 ), (\$ 1985 )

| <u>YEARS</u> | <u>TYPES OF CONSTRUCTION</u> |                  |                    |               |              |
|--------------|------------------------------|------------------|--------------------|---------------|--------------|
|              | <u>CAMP/TRAILS</u>           | <u>BUILDINGS</u> | <u>ROADS/DOCKS</u> | <u>OTHERS</u> | <u>TOTAL</u> |
| 1985         | \$0                          | \$50,000         | \$200,000          | \$50,000      | \$300,000    |
| 1986         | \$20,000                     | \$100,000        | \$100,000          | \$75,000      | \$295,000    |
| 1987         | \$60,000                     | \$300,000        | \$100,000          | \$60,000      | \$520,000    |
| 1988         | \$100,000                    | \$200,000        | \$100,000          | \$100,000     | \$500,000    |
| 1989         | \$80,000                     | \$100,000        | \$50,000           | \$50,000      | \$280,000    |
| 1990         | \$50,000                     | \$50,000         | \$0                | \$50,000      | \$150,000    |
| 1991         | \$50,000                     | \$25,000         | \$0                | \$50,000      | \$125,000    |
| 1992         | \$0                          | \$0              | \$0                | \$50,000      | \$50,000     |
| 1993         | \$0                          | \$0              | \$0                | \$50,000      | \$50,000     |
| 1994         | \$0                          | \$0              | \$0                | \$50,000      | \$50,000     |

TABLE 2 ( continued)

Result tables for example 1

TABLE 8: PROFITS, SALARIES AND LOCAL EXPENDITURE ON  
CONSTRUCTION MATERIALS  
(OPTION 1 )

WEEKLY AVERAGE WAGES AND SALARIES: \$520.0

LOCAL % OF CONSTRUCTION WAGES AND SALARIES: 0.50

PROFITS AND OVERHEAD PER % OF CONSTRUCTION: 0.13

WAGES AND SALARIES PER % OF CONSTRUCTION (LESS PROF.)

| CAMP/TRAILS | BUILDINGS | ROADS/DOCKS | OTHERS |
|-------------|-----------|-------------|--------|
| 0.70        | 0.35      | 0.15        | 0.40   |

PURCHASES OF LOCAL MATERIALS PER % OF CONST. (LESS PROF. AND SAL.)

| CAMP/TRAILS | BUILDINGS | ROADS/DOCKS | OTHERS |
|-------------|-----------|-------------|--------|
| 0.80        | 0.70      | 0.50        | 0.60   |

DISTRIBUTION OF LOCAL MATERIAL PURCHASES BY TYPE OF EXPENDITURES

| GROCERY ACCOMMODATIONS | RECREATION | TRANSPORT | OTHERS |
|------------------------|------------|-----------|--------|
| 0.05                   | 0.05       | 0.00      | 0.10   |
|                        |            |           | 0.80   |

TABLE 9: PARKS CANADA LOCAL CONSTRUCTION EXPENDITURES  
(OPTION 1 ), (\$ 1985 )

| YEARS | LOCAL GOODS<br>AND SERVICES | WAGE BILL TO<br>LOCAL EMPLOYEES | TOTAL     |
|-------|-----------------------------|---------------------------------|-----------|
| 1985  | \$109,403                   | \$29,363                        | \$138,765 |
| 1986  | \$104,226                   | \$40,890                        | \$145,116 |
| 1987  | \$187,050                   | \$80,910                        | \$267,960 |
| 1988  | \$168,345                   | \$84,825                        | \$253,170 |
| 1989  | \$90,437                    | \$51,548                        | \$141,984 |
| 1990  | \$45,893                    | \$31,538                        | \$77,430  |
| 1991  | \$35,996                    | \$27,731                        | \$63,728  |
| 1992  | \$15,660                    | \$8,700                         | \$24,360  |
| 1993  | \$15,660                    | \$8,700                         | \$24,360  |
| 1994  | \$15,660                    | \$8,700                         | \$24,360  |

TABLE 2 (continued)

Result tables for example 1

TABLE 10: INFORMATION REQUIRED FOR PARAMETER ESTIMATES  
AND TO INCOME MULTIPLIER, 1985  
(OPTION 1 ), (\$ 1985 )

TOTAL SALES OF LOCAL FIRMS: \$1,500,000

TOTAL EMPLOYMENT OF LOCAL FIRMS(P.V.'S): 50.0

WEEKLY AVERAGE WAGES AND SALARIES IN LOCAL FIRMS: \$120.00

PROP. LOCAL SALES INCREASE NECESSARY TO CREATE ONE JOB: 1.30

LOCAL PURCHASES BY LOCAL RESIDENTS

| GROCERY   | ACCOMODATIONS | RECREATION | TRANSPORT | OTHERS    |
|-----------|---------------|------------|-----------|-----------|
| \$495,000 | \$18,500      | \$31,000   | \$313,500 | \$250,000 |

TOTAL INCOME OF LOCAL RESIDENTS: \$1,800,000

INCOME OF LOCAL EMPLOYEES AND EMPLOYERS PER PURCHASE \$

| GROCERY | ACCOMODATIONS | RECREATION | TRANSPORT | OTHERS |
|---------|---------------|------------|-----------|--------|
| 0.30    | 0.35          | 0.20       | 0.25      | 0.30   |

LOCAL PURCHASES BY LOCAL FIRMS ON THEIR TOTAL SALES

| GROCERY | ACCOMODATIONS | RECREATION | TRANSPORT | OTHERS |
|---------|---------------|------------|-----------|--------|
| 0.10    | 0.25          | 0.15       | 0.10      | 0.15   |

TABLE 11: K1,K2,K3,K4,K5,K6 PARAMETER VALUES  
AND K11,K12 MULTIPLIER VALUES  
(OPTION 1 )

| PARAMETERS |      |      |      |      |      |
|------------|------|------|------|------|------|
| K1         | K2   | K3   | K4   | K5   | K6   |
| 0.62       | 0.28 | 0.26 | 0.29 | 0.30 | 0.12 |

| MULTIPLIERS |      |
|-------------|------|
| K11         | K12  |
| 1.21        | 1.13 |

K1 = AVERAGE PROPENSITY TO CONSUME LOCALLY.

K2 = PROPORTION OF PURCHASES OF RESIDENTS THAT RESULTS IN LOCAL INCOME.

K3 = PROPORTION OF PURCHASES OF PARK THAT RESULTS IN LOCAL INCOME.

K4 = PROPORTION OF PURCHASES OF VISITORS THAT RESULTS IN LOCAL INCOME.

K5 = PROPORTION OF CONS. MATERIAL PURCHASES THAT RESULTS IN LOCAL INCOME.

K6 = PROPORTION OF LOCAL FIRMS LOCAL PURCHASES ON THEIR SALES.

K11 = INDUCED EFFECT MULTIPLIER

K12 = INDIRECT EFFECT MULTIPLIER

TABLE 2 ( continued )  
Result tables for example 1

TABLE 12A: LOCAL INCOME IMPACT, 1985 ,  
BY IMPACT SOURCE  
(OPTION 1 ), ( \$ 1985 )

| <u>IMPACT SOURCE</u>          | <u>TYPES OF IMPACT</u> |                         | TOTAL     |
|-------------------------------|------------------------|-------------------------|-----------|
|                               | DIRECT                 | INDIRECT<br>AND INDUCED |           |
| VISITOR PURCHASES             | \$35,410               | \$12,108                | \$47,518  |
| <u>OPERATING EXPENDITURES</u> |                        |                         |           |
| EMPLOYEE WAGES                | \$300,000              | \$70,351                | \$370,351 |
| PARK PURCHASES                | \$7,055                | \$2,412                 | \$9,467   |
| <u>CONSTRUCTION PURCHASES</u> |                        |                         |           |
| EMPLOYEE WAGES                | \$29,363               | \$6,886                 | \$36,248  |
| PARK PURCHASES                | \$32,547               | \$11,129                | \$43,676  |
| TOTAL                         | \$404,375              | \$102,886               | \$507,260 |

TABLE 12B: LOCAL INCOME IMPACT, 1994 ,  
BY IMPACT SOURCE  
(OPTION 1 ), ( \$ 1985 )

| <u>IMPACT SOURCE</u>          | <u>TYPES OF IMPACT</u> |                         | TOTAL     |
|-------------------------------|------------------------|-------------------------|-----------|
|                               | DIRECT                 | INDIRECT<br>AND INDUCED |           |
| VISITOR PURCHASES             | \$44,960               | \$15,373                | \$60,334  |
| <u>OPERATING EXPENDITURES</u> |                        |                         |           |
| EMPLOYEE WAGES                | \$390,000              | \$91,456                | \$481,456 |
| PARK PURCHASES                | \$7,288                | \$2,492                 | \$9,779   |
| <u>CONSTRUCTION PURCHASES</u> |                        |                         |           |
| EMPLOYEE WAGES                | \$8,700                | \$2,040                 | \$10,740  |
| PARK PURCHASES                | \$4,639                | \$1,593                 | \$6,232   |
| TOTAL                         | \$455,607              | \$112,955               | \$568,561 |

TABLE 2 ( continued)  
Result tables for example 1

TABLE 13: LOCAL INCOME IMPACT 1985 - 1994 ,

BY IMPACT SOURCE  
(OPTION 1 ), (\$ 1985 )

| IMPACT SOURCE                 | TYPES OF IMPACT |                         | TOTAL       |
|-------------------------------|-----------------|-------------------------|-------------|
|                               | DIRECT          | INDIRECT<br>AND INDUCED |             |
| VISITOR PURCHASES             | \$401,851       | \$137,406               | \$539,257   |
| <u>OPERATING EXPENDITURES</u> |                 |                         |             |
| EMPLOYEE WAGES                | \$3,450,000     | \$809,035               | \$4,259,035 |
| PARK PURCHASES                | \$71,713        | \$24,521                | \$96,234    |
| <u>CONSTRUCTION PURCHASES</u> |                 |                         |             |
| EMPLOYEE WAGES                | \$372,904       | \$87,447                | \$460,351   |
| PARK PURCHASES                | \$234,528       | \$80,193                | \$314,721   |
| TOTAL                         | \$4,530,996     | \$1,138,602             | \$5,669,598 |

TABLE 14: LOCAL INCOME IMPACT 1985 - 1994 ,

BY YEAR  
(OPTION 1 ), (\$ 1985 )

| YEARS | TYPES OF IMPACT |                         | TOTAL       |
|-------|-----------------|-------------------------|-------------|
|       | DIRECT          | INDIRECT<br>AND INDUCED |             |
| 1985  | \$404,375       | \$102,086               | \$507,260   |
| 1986  | \$425,449       | \$107,779               | \$533,228   |
| 1987  | \$501,196       | \$128,306               | \$629,502   |
| 1988  | \$510,634       | \$130,038               | \$640,671   |
| 1989  | \$465,265       | \$117,026               | \$582,291   |
| 1990  | \$443,090       | \$110,519               | \$553,609   |
| 1991  | \$447,427       | \$111,336               | \$558,763   |
| 1992  | \$433,433       | \$107,521               | \$540,954   |
| 1993  | \$444,520       | \$110,238               | \$554,758   |
| 1994  | \$455,607       | \$112,955               | \$568,561   |
| TOTAL | \$4,530,996     | \$1,138,602             | \$5,669,598 |

**TABLE 2 ( continued)**  
**Result tables for example 1**

**TABLE 15: NUMBER OF LOCAL P.Y.'S DIRECTLY ASSOCIATED  
 WITH PARKS CANADA EXPENDITURES, BY YEAR,  
 IN PERSON-YEARS  
 (OPTION 1 )**

| <u>YEARS</u> | <u>TYPE OF EMPLOYEES</u> |                  | <u>TOTAL</u>   |
|--------------|--------------------------|------------------|----------------|
|              | <u>CONSTRUCTION</u>      | <u>OPERATION</u> |                |
| 1985         | 1.1                      | 99.0             | 100.1          |
| 1986         | 1.5                      | 104.0            | 105.5          |
| 1987         | 3.0                      | 109.0            | 112.0          |
| 1988         | 3.1                      | 114.0            | 117.1          |
| 1989         | 1.9                      | 120.0            | 121.9          |
| 1990         | 1.2                      | 126.0            | 127.2          |
| 1991         | 1.0                      | 133.0            | 134.0          |
| 1992         | 0.3                      | 139.0            | 139.3          |
| 1993         | 0.3                      | 146.0            | 146.3          |
| 1994         | 0.3                      | 154.0            | 154.3          |
| <b>TOTAL</b> | <b>13.8</b>              | <b>1,244.0</b>   | <b>1,257.8</b> |

**TABLE 16: LOCAL EMPLOYMENT IMPACT, 1985 - 1994 ,  
 BY IMPACT SOURCE, IN PERSON-YEARS  
 (OPTION 1 )**

| <u>IMPACT SOURCE</u>                 | <u>TYPES OF IMPACT</u> |                                 | <u>TOTAL</u>   |
|--------------------------------------|------------------------|---------------------------------|----------------|
|                                      | <u>DIRECT</u>          | <u>INDIRECT<br/>AND INDUCED</u> |                |
| <b>VISITOR PURCHASES</b>             | <b>35.3</b>            | <b>12.3</b>                     | <b>47.6</b>    |
| <b><u>OPERATING EXPENDITURES</u></b> |                        |                                 |                |
| <b>EMPLOYEE WAGES</b>                | <b>1,244.0</b>         | <b>73.1</b>                     | <b>1,317.1</b> |
| <b>PARK PURCHASES</b>                | <b>7.1</b>             | <b>2.3</b>                      | <b>9.4</b>     |
| <b><u>CONSTRUCTION PURCHASES</u></b> |                        |                                 |                |
| <b>EMPLOYEE WAGES</b>                | <b>13.8</b>            | <b>7.9</b>                      | <b>21.7</b>    |
| <b>PARK PURCHASES</b>                | <b>20.2</b>            | <b>7.1</b>                      | <b>27.3</b>    |
| <b>TOTAL</b>                         | <b>1,320.4</b>         | <b>102.7</b>                    | <b>1,423.1</b> |

**TABLE 2 ( continued)**  
**Result tables for example 1**

**TABLE 17: LOCAL EMPLOYMENT IMPACT 1985 - 1994 ,**  
**BY YEAR, IN PERSON-YEARS**  
**(OPTION 1 )**

| <u>YEARS</u> | <u>TYPES OF IMPACT</u> |                                 | <u>TOTAL</u>   |
|--------------|------------------------|---------------------------------|----------------|
|              | <u>DIRECT</u>          | <u>INDIRECT<br/>AND INDUCED</u> |                |
| 1985         | 106.7                  | 9.3                             | 116.0          |
| 1986         | 112.1                  | 9.7                             | 121.8          |
| 1987         | 120.8                  | 11.6                            | 132.3          |
| 1988         | 125.6                  | 11.7                            | 137.3          |
| 1989         | 128.4                  | 10.6                            | 139.0          |
| 1990         | 132.6                  | 10.0                            | 142.6          |
| 1991         | 139.3                  | 10.0                            | 149.4          |
| 1992         | 144.2                  | 9.7                             | 153.9          |
| 1993         | 151.3                  | 9.9                             | 161.2          |
| 1994         | 159.4                  | 10.2                            | 169.6          |
| <b>TOTAL</b> | <b>1,320.4</b>         | <b>102.7</b>                    | <b>1,423.1</b> |

TABLE 3

Data bank for example 2

Screen 1 GENERAL INFORMATION

- (1) Name of park/site MINGANIE NATIONAL PARK  
 (2) Option analyzed 2  
 (3) First year to be analyzed 1985  
 (4) Number of years to be analyzed 10 maximum 10  
 (5) Number of types of visitors 3 maximum 4  
 (6) Number of types of expenditures 5 maximum 5

Press F10 to continue - F5 to abort

Screen 2 (8) NUMBER OF VISITOR-DAYS

(7) Types of visitors

|      | DAY USERS | CAMPING | HOTEL |
|------|-----------|---------|-------|
| 1985 | 1200      | 2000    | 1700  |
| 1986 | 1250      | 2050    | 1750  |
| 1987 | 1300      | 2100    | 1800  |
| 1988 | 1350      | 2150    | 1850  |
| 1989 | 1400      | 2200    | 1900  |
| 1990 | 1450      | 2250    | 1950  |
| 1991 | 1500      | 2300    | 2000  |
| 1992 | 1550      | 2350    | 2050  |
| 1993 | 1600      | 2400    | 2100  |
| 1994 | 1650      | 2450    | 2150  |

Press F10 to continue - F5 to abort

TABLE 3 (continued)  
Data bank for example 2

Screen 3 (10) DAILY LOCAL EXPENDITURE OF VISITORS

| (9) Types of expenditures | Types of visitors |         |       |
|---------------------------|-------------------|---------|-------|
|                           | DAY USERS         | CAMPING | MOTEL |
| GROCERY                   | 3.00              | 5.00    | 4.00  |
| ACCOMMODATIONS            | 3.00              | 2.00    | 20.00 |
| RECREATION                | 3.00              | 2.00    | 4.00  |
| TRANSPORT                 | 4.00              | 4.00    | 4.00  |
| OTHERS                    | 2.00              | 2.50    | 3.00  |

Press F10 to continue - F5 to abort

Screen 4

11: Operation expenditures of local goods and services by the park/site  
12: Local wages and salaries paid for operation of park/site  
13: Number of local p.y.'s directly associated with operation of park/site

|      | *** 11 *** | *** 12 *** | *** 13 *** |
|------|------------|------------|------------|
| 1985 | 27300      | 300000     | 99         |
| 1986 | 27400      | 310000     | 104        |
| 1987 | 27500      | 320000     | 109        |
| 1988 | 27600      | 330000     | 114        |
| 1989 | 27700      | 340000     | 120        |
| 1990 | 27800      | 350000     | 126        |
| 1991 | 27900      | 360000     | 133        |
| 1992 | 28000      | 370000     | 139        |
| 1993 | 28100      | 380000     | 146        |
| 1994 | 28200      | 390000     | 154        |

Press F10 to continue - F5 to abort

TABLE 3 (continued)  
Data bank for example 2

Screen 5

14: Operation expend. of local goods and services by the park/site in 1985

15: Local goods and services purchased by local residents in 1985

|                | *** 14 *** | *** 15 *** |
|----------------|------------|------------|
| GROCERY        | 7100       | 495000     |
| ACCOMMODATIONS | 4100       | 18500      |
| RECREATION     | 12700      | 31000      |
| TRANSPORT      | 1400       | 313500     |
| OTHERS         | 2000       | 250000     |

Press F10 to continue - F5 to abort

Screen 6

(16) Number of construction categories

1      maximum 4

Press F10 to continue - F5 to abort

TABLE 3 (continued)  
Data bank for example 2

Screen 7

(18) CONSTRUCTION EXPENDITURES

(17) Categories of construction

TOTAL

|      |   |
|------|---|
| 1985 | 0 |
| 1986 | 0 |
| 1987 | 0 |
| 1988 | 0 |
| 1989 | 0 |
| 1990 | 0 |
| 1991 | 0 |
| 1992 | 0 |
| 1993 | 0 |
| 1994 | 0 |

Press F10 to continue - F3 to abort

Screen 8

(19) Distribution of purchases of local const. materials in 1985

| GROCERY | ACCOMODATIONS | LEASURE | TRANSPORT | OTHERS |
|---------|---------------|---------|-----------|--------|
| 0.00    | 0.00          | 0.00    | 0.00      | 0.00   |

(20) Wages and salaries per dollar of construction  
(less profits and overhead)

TOTAL  
0.00

(21) Local material purchase per dollar of construction  
(less profits, overhead, salaries and wages)

TOTAL  
0.00

(22) Profits and overhead per dollar of construction 0.00

(23) % of construction wages paid in the region 0.00

(24) Weekly wage and salary in construction ind. in 1985 0.00

Press F10 to continue - F3 to abort

TABLE 3 (continued)  
Data bank for example 2

Screen 9

|      |                                                              |               |            |           |        |         |
|------|--------------------------------------------------------------|---------------|------------|-----------|--------|---------|
| (25) | K1                                                           | K2            | K3         | K4        | K5     | K6      |
|      | 0.00                                                         | 0.00          | 0.00       | 0.00      | 0.00   | 0.00    |
| (26) | Total sales of local firms in 1985                           |               |            |           |        | 0       |
| (27) | 1 local sales must increase to create one job in 1985        |               |            |           |        | 1.30    |
| (28) | Weekly average salaries in local firms in 1985               |               |            |           |        | 120.00  |
| (29) | Total local firms p.y.'s in 1985                             |               |            |           |        | 0       |
| (30) | Local residents' total income in 1985                        |               |            |           |        | 1800000 |
| (31) | Local employees and employers income per purchase \$ in 1985 |               |            |           |        |         |
|      | GROCERY                                                      | ACCOMODATIONS | RECREATION | TRANSPORT | OTHERS |         |
|      | .30                                                          | .35           | .20        | .25       | .30    |         |
| (32) | Ratio of firms' local purchases to total sales in 1985       |               |            |           |        |         |
|      | GROCERY                                                      | ACCOMODATIONS | RECREATION | TRANSPORT | OTHERS |         |
|      | .10                                                          | .25           | .15        | .10       | .15    |         |

Press F10 to continue - F5 to abort

TABLE 4

Result tables for example 2

TABLE 1: NUMBERS OF VISITOR-DAYS, BY TYPE OF VISITOR  
(OPTION 2)

| YEARS | TYPES OF VISITORS |         |       | TOTAL |
|-------|-------------------|---------|-------|-------|
|       | DAY USERS         | CAMPING | HOTEL |       |
| 1985  | 1,200             | 2,000   | 1,700 | 4,900 |
| 1986  | 1,250             | 2,050   | 1,750 | 5,050 |
| 1987  | 1,300             | 2,100   | 1,800 | 5,200 |
| 1988  | 1,350             | 2,150   | 1,850 | 5,350 |
| 1989  | 1,400             | 2,200   | 1,900 | 5,500 |
| 1990  | 1,450             | 2,250   | 1,950 | 5,650 |
| 1991  | 1,500             | 2,300   | 2,000 | 5,800 |
| 1992  | 1,550             | 2,350   | 2,050 | 5,950 |
| 1993  | 1,600             | 2,400   | 2,100 | 6,100 |
| 1994  | 1,650             | 2,450   | 2,150 | 6,250 |

TABLE 2: DAILY VISITOR LOCAL EXPENDITURES  
(OPTION 2), (\$ 1985)

| TYPES OF EXPENDITURES | TYPES OF VISITORS |         |         |
|-----------------------|-------------------|---------|---------|
|                       | DAY USERS         | CAMPING | HOTEL   |
| GROCERY               | \$3.00            | \$5.00  | \$4.00  |
| ACCOMMODATIONS        | \$3.00            | \$2.00  | \$20.00 |
| RECREATION            | \$3.00            | \$2.00  | \$4.00  |
| TRANSPORT             | \$4.00            | \$4.00  | \$4.00  |
| OTHERS                | \$2.00            | \$2.50  | \$3.00  |
| TOTAL                 | \$17.00           | \$17.50 | \$37.00 |

TABLE 4 (continued)  
Result tables for example 2

TABLE 3: VISITOR LOCAL EXPENDITURES, BY TYPE OF VISITOR  
(OPTION 2 ), (\$ 1985 )

| YEARS | TYPES OF VISITORS |          |          | TOTAL     |
|-------|-------------------|----------|----------|-----------|
|       | DAY USERS         | CAMPING  | HOTEL    |           |
| 1985  | \$20,400          | \$35,000 | \$62,900 | \$118,300 |
| 1986  | \$21,250          | \$35,875 | \$64,750 | \$121,875 |
| 1987  | \$22,100          | \$36,750 | \$66,600 | \$125,450 |
| 1988  | \$22,950          | \$37,625 | \$68,450 | \$129,025 |
| 1989  | \$23,800          | \$38,500 | \$70,300 | \$132,600 |
| 1990  | \$24,650          | \$39,375 | \$72,150 | \$136,175 |
| 1991  | \$25,500          | \$40,250 | \$74,000 | \$139,750 |
| 1992  | \$26,350          | \$41,125 | \$75,850 | \$143,325 |
| 1993  | \$27,200          | \$42,000 | \$77,700 | \$146,900 |
| 1994  | \$28,050          | \$42,875 | \$79,550 | \$150,475 |

TABLE 4: VISITOR LOCAL EXPENDITURES, BY TYPE OF EXPENDITURE  
(OPTION 2 ), (\$ 1985 )

| YEARS | TYPES OF EXPENDITURES |            |           |           | OTHERS    |
|-------|-----------------------|------------|-----------|-----------|-----------|
|       | GROCERY ACCOMODATIONS | RECREATION | TRANSPORT |           |           |
| 1985  | \$20,400              | \$41,600   | \$14,400  | \$29,400  | \$12,500  |
| 1986  | \$21,000              | \$42,850   | \$14,850  | \$30,300  | \$12,875  |
| 1987  | \$21,600              | \$44,100   | \$15,300  | \$31,200  | \$13,250  |
| 1988  | \$22,200              | \$45,350   | \$15,750  | \$32,100  | \$13,625  |
| 1989  | \$22,800              | \$46,600   | \$16,200  | \$33,000  | \$14,000  |
| 1990  | \$23,400              | \$47,850   | \$16,650  | \$33,900  | \$14,375  |
| 1991  | \$24,000              | \$49,100   | \$17,100  | \$34,800  | \$14,750  |
| 1992  | \$24,600              | \$50,350   | \$17,550  | \$35,700  | \$15,125  |
| 1993  | \$25,200              | \$51,600   | \$18,000  | \$36,600  | \$15,500  |
| 1994  | \$25,800              | \$52,850   | \$18,450  | \$37,500  | \$15,875  |
| TOTAL | \$231,000             | \$472,250  | \$164,250 | \$334,500 | \$141,875 |

# TABLE 4 (continued)

## Result tables for example 2

TABLE 5: PARKS CANADA OPERATING EXPENDITURES MADE LOCALLY  
(OPTION 2 ), (\$ 1985 )

| YEARS | LOCAL GOODS<br>AND SERVICES | WAGE BILL TO<br>LOCAL EMPLOYEES | TOTAL     |
|-------|-----------------------------|---------------------------------|-----------|
| 1985  | \$27,300                    | \$300,000                       | \$327,300 |
| 1986  | \$27,400                    | \$310,000                       | \$337,400 |
| 1987  | \$27,500                    | \$320,000                       | \$347,500 |
| 1988  | \$27,600                    | \$330,000                       | \$357,600 |
| 1989  | \$27,700                    | \$340,000                       | \$367,700 |
| 1990  | \$27,800                    | \$350,000                       | \$377,800 |
| 1991  | \$27,900                    | \$360,000                       | \$387,900 |
| 1992  | \$28,000                    | \$370,000                       | \$398,000 |
| 1993  | \$28,100                    | \$380,000                       | \$408,100 |
| 1994  | \$28,200                    | \$390,000                       | \$418,200 |

TABLE 6: PARKS CANADA OPERATION EXPENDITURES ON LOCAL GOODS AND SERVICES  
BY TYPE OF EXPENDITURE  
(OPTION 2 ), (\$ 1985 )

| YEARS | TYPES OF EXPENDITURES  |            |           |         |
|-------|------------------------|------------|-----------|---------|
|       | GROCERY ACCOMMODATIONS | RECREATION | TRANSPORT | OTHERS  |
| 1985  | \$7,100                | \$4,100    | \$12,700  | \$1,400 |

TABLE 7: PARKS CANADA CONSTRUCTION EXPENDITURES,  
BY TYPE OF CONSTRUCTION  
(OPTION 2 ), (\$ 1985 )

NOT AVAILABLE

TABLE 8: PROFITS, SALARIES AND LOCAL EXPENDITURE ON  
CONSTRUCTION MATERIALS  
(OPTION 2 )

NOT AVAILABLE

TABLE 4 (continued)  
Result tables for example 2

TABLE 9: PARKS CANADA LOCAL CONSTRUCTION EXPENDITURES  
(OPTION 2 ), (\$ 1985 )

NOT AVAILABLE

TABLE 10: INFORMATION REQUIRED FOR PARAMETER ESTIMATES  
AND TO INCOME MULTIPLIER, 1985  
(OPTION 2 ), (\$ 1985 )

TOTAL SALES OF LOCAL FIRMS: NOT AVAILABLE

TOTAL EMPLOYMENT OF LOCAL FIRMS(P.V.'S): NOT AVAILABLE

WEEKLY AVERAGE WAGES AND SALARIES IN LOCAL FIRMS: \$120.00

PROP. LOCAL SALES INCREASE NECESSARY TO CREATE ONE JOB: 1.30

LOCAL PURCHASES BY LOCAL RESIDENTS

| GROCERY ACCOMODATIONS | RECREATION | TRANSPORT | OTHERS    |
|-----------------------|------------|-----------|-----------|
| \$495,000             | \$18,500   | \$31,000  | \$250,000 |

TOTAL INCOME OF LOCAL RESIDENTS: \$1,800,000

INCOME OF LOCAL EMPLOYEES AND EMPLOYERS PER PURCHASE \$

| GROCERY ACCOMODATIONS | RECREATION | TRANSPORT | OTHERS |
|-----------------------|------------|-----------|--------|
| 0.30                  | 0.35       | 0.20      | 0.30   |

LOCAL PURCHASES BY LOCAL FIRMS ON THEIR TOTAL SALES

| GROCERY ACCOMODATIONS | RECREATION | TRANSPORT | OTHERS |
|-----------------------|------------|-----------|--------|
| 0.10                  | 0.25       | 0.15      | 0.15   |

**TABLE 4 (continued)**  
**Result tables for example 2**

**TABLE 11: K1,K2,K3,K4,K5,K6 PARAMETER VALUES  
AND K11,K12 MULTIPLIER VALUES  
(OPTION 2 )**

| <u>PARAMETERS</u>  |      |      |      |      |      |
|--------------------|------|------|------|------|------|
| K1                 | K2   | K3   | K4   | K5   | K6   |
| 0.62               | 0.28 | 0.26 | 0.29 | 0.00 | 0.12 |
| <u>MULTIPLIERS</u> |      |      |      |      |      |
| K11                | K12  |      |      |      |      |
| 1.21               | 1.13 |      |      |      |      |

K1 = AVERAGE PROPENSITY TO CONSUME LOCALLY.  
K2 = PROPORTION OF PURCHASES OF RESIDENTS THAT RESULTS IN LOCAL INCOME.  
K3 = PROPORTION OF PURCHASES OF PARK THAT RESULTS IN LOCAL INCOME.  
K4 = PROPORTION OF PURCHASES OF VISITORS THAT RESULTS IN LOCAL INCOME.  
K5 = PROPORTION OF CONS. MATERIAL PURCHASES THAT RESULTS IN LOCAL INCOME.  
K6 = PROPORTION OF LOCAL FIRMS LOCAL PURCHASES ON THEIR SALES.

K11 = INDUCED EFFECT MULTIPLIER  
K12 = INDIRECT EFFECT MULTIPLIER

**TABLE 12A: LOCAL INCOME IMPACT, 1985 ,  
BY IMPACT SOURCE  
(OPTION 2 ) , ( 1985 )**

| <u>IMPACT SOURCE</u>          | <u>TYPES OF IMPACT</u> |                         | TOTAL     |
|-------------------------------|------------------------|-------------------------|-----------|
|                               | DIRECT                 | INDIRECT<br>AND INDUCED |           |
| VISITOR PURCHASES             | \$34,660               | \$11,051                | \$46,511  |
| <u>OPERATING EXPENDITURES</u> |                        |                         |           |
| EMPLOYEE WAGES                | \$300,000              | \$70,351                | \$370,351 |
| PARK PURCHASES                | \$7,055                | \$2,412                 | \$9,467   |
| TOTAL                         | \$341,715              | \$84,615                | \$426,330 |

**TABLE 4 (continued)**  
**Result tables for example 2**

**TABLE 12B: LOCAL INCOME IMPACT, 1994 ,  
 BY IMPACT SOURCE  
 (OPTION 2 ), (\$ 1985 )**

| <u>IMPACT SOURCE</u>          | <u>TYPES OF IMPACT</u> |                                 | <u>TOTAL</u> |
|-------------------------------|------------------------|---------------------------------|--------------|
|                               | <u>DIRECT</u>          | <u>INDIRECT<br/>AND INDUCED</u> |              |
| VISITOR PURCHASES             | \$44,087               | \$15,075                        | \$59,162     |
| <u>OPERATING EXPENDITURES</u> |                        |                                 |              |
| EMPLOYEE WAGES                | \$390,000              | \$91,456                        | \$481,456    |
| PARK PURCHASES                | \$7,288                | \$2,492                         | \$9,779      |
| TOTAL                         | \$441,374              | \$109,023                       | \$550,397    |

**TABLE 13: LOCAL INCOME IMPACT 1985 - 1994 ,  
 BY IMPACT SOURCE  
 (OPTION 2 ), (\$ 1985 )**

| <u>IMPACT SOURCE</u>          | <u>TYPES OF IMPACT</u> |                                 | <u>TOTAL</u> |
|-------------------------------|------------------------|---------------------------------|--------------|
|                               | <u>DIRECT</u>          | <u>INDIRECT<br/>AND INDUCED</u> |              |
| VISITOR PURCHASES             | \$393,734              | \$134,631                       | \$528,365    |
| <u>OPERATING EXPENDITURES</u> |                        |                                 |              |
| EMPLOYEE WAGES                | \$3,450,000            | \$809,035                       | \$4,259,035  |
| PARK PURCHASES                | \$71,713               | \$24,521                        | \$96,234     |
| TOTAL                         | \$3,915,447            | \$968,187                       | \$4,883,634  |

**TABLE 4 (continued)**  
**Result tables for example 2**

**TABLE 14: LOCAL INCOME IMPACT 1985 - 1994 ,  
 BY YEAR  
 (OPTION 2 ), (\$ 1985 )**

| <u>YEARS</u> | <u>TYPES OF IMPACT</u> |                                 | <u>TOTAL</u>       |
|--------------|------------------------|---------------------------------|--------------------|
|              | <u>DIRECT</u>          | <u>INDIRECT<br/>AND INDUCED</u> |                    |
| 1985         | \$341,715              | \$84,615                        | \$426,330          |
| 1986         | \$352,788              | \$87,327                        | \$440,115          |
| 1987         | \$363,862              | \$90,039                        | \$453,900          |
| 1988         | \$374,935              | \$92,751                        | \$467,685          |
| 1989         | \$386,008              | \$95,463                        | \$481,471          |
| 1990         | \$397,081              | \$98,175                        | \$495,256          |
| 1991         | \$408,155              | \$100,887                       | \$509,041          |
| 1992         | \$419,228              | \$103,599                       | \$522,827          |
| 1993         | \$430,301              | \$106,311                       | \$536,612          |
| 1994         | \$441,374              | \$109,023                       | \$550,397          |
| <b>TOTAL</b> | <b>\$3,915,447</b>     | <b>\$968,187</b>                | <b>\$4,883,634</b> |

**TABLE 15: NUMBER OF LOCAL P.V.'S DIRECTLY ASSOCIATED  
 WITH PARKS CANADA EXPENDITURES, BY YEAR,  
 IN PERSON-YEARS  
 (OPTION 2 )**

| <u>YEARS</u> | <u>TOTAL</u>   |
|--------------|----------------|
| 1985         | 99.0           |
| 1986         | 104.0          |
| 1987         | 109.0          |
| 1988         | 114.0          |
| 1989         | 120.0          |
| 1990         | 126.0          |
| 1991         | 133.0          |
| 1992         | 139.0          |
| 1993         | 146.0          |
| 1994         | 154.0          |
| <b>TOTAL</b> | <b>1,244.0</b> |

TABLE 4 (continued)  
Result tables for example 2

TABLE 16: LOCAL EMPLOYMENT IMPACT, 1985 - 1994 ,  
BY IMPACT SOURCE, IN PERSON-YEARS  
(OPTION 2 )

| IMPACT SOURCE                 | TYPES OF IMPACT |                         | TOTAL   |
|-------------------------------|-----------------|-------------------------|---------|
|                               | DIRECT          | INDIRECT<br>AND INDUCED |         |
| VISITOR PURCHASES             | 48.5            | 16.6                    | 65.1    |
| <u>OPERATING EXPENDITURES</u> |                 |                         |         |
| EMPLOYEE WAGES                | 1,244.0         | 99.7                    | 1,343.7 |
| PARK PURCHASES                | 8.8             | 3.0                     | 11.9    |
| TOTAL                         | 1,301.4         | 119.4                   | 1,420.7 |

TABLE 17: LOCAL EMPLOYMENT IMPACT 1985 - 1994 ,  
BY YEAR, IN PERSON-YEARS  
(OPTION 2 )

| YEARS | TYPES OF IMPACT |                         | TOTAL   |
|-------|-----------------|-------------------------|---------|
|       | DIRECT          | INDIRECT<br>AND INDUCED |         |
| 1985  | 104.1           | 10.4                    | 114.6   |
| 1986  | 109.3           | 10.8                    | 120.0   |
| 1987  | 114.4           | 11.1                    | 125.5   |
| 1988  | 119.5           | 11.4                    | 131.0   |
| 1989  | 125.7           | 11.8                    | 137.4   |
| 1990  | 131.8           | 12.1                    | 143.9   |
| 1991  | 138.9           | 12.4                    | 151.4   |
| 1992  | 145.1           | 12.8                    | 157.8   |
| 1993  | 152.2           | 13.1                    | 165.3   |
| 1994  | 160.3           | 13.4                    | 173.8   |
| TOTAL | 1,301.4         | 119.4                   | 1,420.7 |

TABLE 5  
Data bank for example 3

Screen 1      GENERAL INFORMATION

(1) Name of park/site    MINGANIE NATIONAL PARK  
(2) Option analyzed      3  
(3) First year to be analyzed      1985  
(4) Number of years to be analyzed    3    maximum 10  
(5) Number of types of visitors      1    maximum 4  
(6) Number of types of expenditures    4    maximum 5

Press F10 to continue - F5 to abort

Screen 2      (8) NUMBER OF VISITOR-DAYS

(7) Types of visitors

TOTAL

|      |      |
|------|------|
| 1985 | 4900 |
| 1986 | 5050 |
| 1987 | 5200 |

Press F10 to continue - F5 to abort

TABLE 5 (continued)  
Data bank for example 3

Screen 3                      (10) DAILY LOCAL EXPENDITURE OF VISITORS

| (9) Types of expenditures |       | Types of visitors |  |
|---------------------------|-------|-------------------|--|
| TOTAL                     |       |                   |  |
| GROCERY                   | 4.00  |                   |  |
| SERVICE STAT.             | 6.00  |                   |  |
| TOURIST SERV.             | 20.00 |                   |  |
| OTHERS                    | 3.00  |                   |  |

Press F10 to continue - F5 to abort

Screen 4

11: Operation expenditures of local goods and services by the park/site  
12: Local wages and salaries paid for operation of park/site  
13: Number of local p.y.'s directly associated with operation of park/site

|      | *** 11 *** | *** 12 *** | *** 13 *** |
|------|------------|------------|------------|
| 1985 | 27300      | 300000     | 99         |
| 1986 | 27400      | 310000     | 104        |
| 1987 | 27500      | 320000     | 109        |

Press F10 to continue - F5 to abort

TABLE 5 (continued)  
Data bank for example 3

Screen 5

14: Operation expend. of local goods and services by the park/site in 1985

15: Local goods and services purchased by local residents in 1985

|               | *** 14 *** | *** 15 *** |
|---------------|------------|------------|
| GROCERY       | 0          | 0          |
| SERVICE STAT. | 0          | 0          |
| TOURIST SERV. | 0          | 0          |
| OTHERS        | 0          | 0          |

Press F10 to continue - F5 to abort

Screen 6

(16) Number of construction categories

1 maximum 4

Press F10 to continue - F5 to abort

**TABLE 5 (continued)**  
**Data bank for example 3**

Screen 7

**(18) CONSTRUCTION EXPENDITURES**

**(17) Categories of construction**

**TOTAL**

|      |        |
|------|--------|
| 1985 | 300000 |
| 1986 | 295000 |
| 1987 | 520000 |

Press F10 to continue - F5 to abort

Screen 8

**(19) Distribution of purchases of local const. materials in 1985**

| GROCERY | SERVICE STAT. | TOURIST SERV. | OTHERS |
|---------|---------------|---------------|--------|
| 0.00    | 0.00          | 0.00          | 0.00   |

**(20) Wages and salaries per dollar of construction  
 (less profits and overhead)**

**TOTAL**  
**.35**

**(21) Local material purchase per dollar of construction  
 (less profits, overhead, salaries and wages)**

**TOTAL**  
**.80**

**(22) Profits and overhead per dollar of construction** **.13**

**(23) % of construction wages paid in the region** **.50**

**(24) Weekly wage and salary in construction ind. in 1985** **\$20.00**

Press F10 to continue - F5 to abort

TABLE 5 (continued)  
Data bank for example 3

Screen 9

|      |                                                              |               |               |        |     |        |
|------|--------------------------------------------------------------|---------------|---------------|--------|-----|--------|
| (25) | K1                                                           | K2            | K3            | K4     | K5  | K6     |
|      | .62                                                          | .28           | .26           | .29    | .30 | .11    |
|      |                                                              |               |               |        |     |        |
| (26) | Total sales of local firms in 1985                           |               |               |        |     | 0      |
| (27) | 1 sales must increase to create one job in 1985              |               |               |        |     | 1.30   |
| (28) | Weekly average salaries in local firms in 1985               |               |               |        |     | 120.00 |
| (29) | Total local firms p.y.'s in 1985                             |               |               |        |     | 0      |
| (30) | Local residents' total income in 1985                        |               |               |        |     | 0      |
|      |                                                              |               |               |        |     |        |
| (31) | Local employees and employers income per purchase \$ in 1985 |               |               |        |     |        |
|      | GROCERY                                                      | SERVICE STAT. | TOURIST SERV. | OTHERS |     |        |
|      | 0.00                                                         | 0.00          | 0.00          | 0.00   |     |        |
|      |                                                              |               |               |        |     |        |
| (32) | Ratio of firms' local purchases to total sales in 1985       |               |               |        |     |        |
|      | GROCERY                                                      | SERVICE STAT. | TOURIST SERV. | OTHERS |     |        |
|      | 0.00                                                         | 0.00          | 0.00          | 0.00   |     |        |

Press F10 to continue - F5 to abort

TABLE 6

Result tables for example 3

TABLE 1: NUMBERS OF VISITOR-DAYS, BY TYPE OF VISITOR  
(OPTION 3 )

| <u>YEARS</u> | <u>TOTAL</u> |
|--------------|--------------|
| 1985         | 4,900        |
| 1986         | 5,050        |
| 1987         | 5,200        |

TABLE 2: DAILY VISITOR LOCAL EXPENDITURES  
(OPTION 3 ), (\$ 1985 )TYPES OF EXPENDITURES

|               |                |
|---------------|----------------|
| GROCERY       | \$4.00         |
| SERVICE STAT. | \$6.00         |
| TOURIST SERV. | \$20.00        |
| OTHERS        | \$3.00         |
| <b>TOTAL</b>  | <b>\$33.00</b> |

TABLE 3: VISITOR LOCAL EXPENDITURES, BY TYPE OF VISITOR  
(OPTION 3 ), (\$ 1985 )

| <u>YEARS</u> | <u>TOTAL</u> |
|--------------|--------------|
| 1985         | \$161,700    |
| 1986         | \$166,650    |
| 1987         | \$171,600    |

TABLE 4: VISITOR LOCAL EXPENDITURES, BY TYPE OF EXPENDITURE  
(OPTION 3 ), (\$ 1985 )

| <u>YEARS</u> | <u>TYPES OF EXPENDITURES</u> |                 |                  |                 |
|--------------|------------------------------|-----------------|------------------|-----------------|
|              | GROCERY                      | SERVICE STAT.   | TOURIST SERV.    | OTHERS          |
| 1985         | \$19,600                     | \$29,400        | \$98,000         | \$14,700        |
| 1986         | \$20,200                     | \$30,300        | \$101,000        | \$15,150        |
| 1987         | \$20,800                     | \$31,200        | \$104,000        | \$15,600        |
| <b>TOTAL</b> | <b>\$60,600</b>              | <b>\$90,900</b> | <b>\$303,000</b> | <b>\$45,450</b> |

# TABLE 6 (continued)

## Result tables for example 3

TABLE 5: PARKS CANADA OPERATING EXPENDITURES MADE LOCALLY  
(OPTION 3 ), (\$ 1985 )

| <u>YEARS</u> | <u>LOCAL GOODS<br/>AND SERVICES</u> | <u>WAGE BILL TO<br/>LOCAL EMPLOYEES</u> | <u>TOTAL</u> |
|--------------|-------------------------------------|-----------------------------------------|--------------|
| 1985         | \$27,300                            | \$300,000                               | \$327,300    |
| 1986         | \$27,400                            | \$310,000                               | \$337,400    |
| 1987         | \$27,500                            | \$320,000                               | \$347,500    |

TABLE 6: PARKS CANADA OPERATION EXPENDITURES ON LOCAL GOODS AND SERVICES  
BY TYPE OF EXPENDITURE  
(OPTION 3 ), (\$ 1985 )

NOT AVAILABLE

TABLE 7: PARKS CANADA CONSTRUCTION EXPENDITURES,  
BY TYPE OF CONSTRUCTION  
(OPTION 3 ), (\$ 1985 )

| <u>YEARS</u> | <u>TOTAL</u> |
|--------------|--------------|
| 1985         | \$300,000    |
| 1986         | \$295,000    |
| 1987         | \$320,000    |

TABLE 8: PROFITS, SALARIES AND LOCAL EXPENDITURE ON  
CONSTRUCTION MATERIALS  
(OPTION 3 )

WEEKLY AVERAGE WAGES AND SALARIES: \$520.0

LOCAL % OF CONSTRUCTION WAGES AND SALARIES: 0.50

PROFITS AND OVERHEAD PER % OF CONSTRUCTION: 0.13

WAGES AND SALARIES PER % OF CONSTRUCTION (LESS PROF.): 0.35

PURCHASES OF LOCAL MATERIALS PER % OF CONST. (LESS PROF. AND SAL.): 0.80

DISTRIBUTION OF LOCAL MATERIAL PURCHASES BY TYPE OF EXPENDITURES  
NOT AVAILABLE

TABLE 6 (continued)

Result tables for example 3

TABLE 9: PARKS CANADA LOCAL CONSTRUCTION EXPENDITURES  
(OPTION 3 ), (\$ 1985 )

| <u>YEARS</u> | <u>LOCAL GOODS<br/>AND SERVICES</u> | <u>WAGE BILL TO<br/>LOCAL EMPLOYEES</u> | <u>TOTAL</u> |
|--------------|-------------------------------------|-----------------------------------------|--------------|
| 1985         | \$135,720                           | \$45,675                                | \$181,395    |
| 1986         | \$133,458                           | \$44,914                                | \$178,372    |
| 1987         | \$235,248                           | \$79,170                                | \$314,418    |

TABLE 10: INFORMATION REQUIRED FOR PARAMETER ESTIMATES  
AND TO INCOME MULTIPLIER, 1985  
(OPTION 3 ), (\$ 1985 )

TOTAL SALES OF LOCAL FIRMS: NOT AVAILABLE

TOTAL EMPLOYMENT OF LOCAL FIRMS(P.V.'S): NOT AVAILABLE

WEEKLY AVERAGE WAGES AND SALARIES IN LOCAL FIRMS: \$120.00

PROP. LOCAL SALES INCREASE NECESSARY TO CREATE ONE JOB: 1.30

LOCAL PURCHASES BY LOCAL RESIDENTS: NOT AVAILABLE

TOTAL INCOME OF LOCAL RESIDENTS: NOT AVAILABLE

INCOME OF LOCAL EMPLOYEES AND EMPLOYERS PER PURCHASE \$: NOT AVAILABLE

LOCAL PURCHASES BY LOCAL FIRMS ON THEIR TOTAL SALES: NOT AVAILABLE

**TABLE 6 (continued)**  
**Result tables for example 3**

**TABLE 11: K1,K2,K3,K4,K5,K6 PARAMETER VALUES  
AND K11,K12 MULTIPLIER VALUES  
(OPTION 3 )**

| <u>PARAMETERS</u>  |      |      |      |      |      |
|--------------------|------|------|------|------|------|
| K1                 | K2   | K3   | K4   | K5   | K6   |
| 0.42               | 0.28 | 0.26 | 0.29 | 0.30 | 0.11 |
| <u>MULTIPLIERS</u> |      |      |      |      |      |
| K11                | K12  |      |      |      |      |
| 1.21               | 1.12 |      |      |      |      |

K1 = AVERAGE PROPENSITY TO CONSUME LOCALLY.  
K2 = PROPORTION OF PURCHASES OF RESIDENTS THAT RESULTS IN LOCAL INCOME.  
K3 = PROPORTION OF PURCHASES OF PARK THAT RESULTS IN LOCAL INCOME.  
K4 = PROPORTION OF PURCHASES OF VISITORS THAT RESULTS IN LOCAL INCOME.  
K5 = PROPORTION OF CONS. MATERIAL PURCHASES THAT RESULTS IN LOCAL INCOME.  
K6 = PROPORTION OF LOCAL FIRMS LOCAL PURCHASES ON THEIR SALES.

K11 = INDUCED EFFECT MULTIPLIER  
K12 = INDIRECT EFFECT MULTIPLIER

**TABLE 12A: LOCAL INCOME IMPACT, 1985 ,  
BY IMPACT SOURCE  
(OPTION 3 ), (6 1985 )**

| <u>IMPACT SOURCE</u>          | <u>TYPES OF IMPACT</u> |                         | TOTAL     |
|-------------------------------|------------------------|-------------------------|-----------|
|                               | DIRECT                 | INDIRECT<br>AND INDUCED |           |
| VISITOR PURCHASES             | \$46,893               | \$15,646                | \$62,539  |
| <u>OPERATING EXPENDITURES</u> |                        |                         |           |
| EMPLOYEE WAGES                | \$300,000              | \$69,457                | \$369,457 |
| PARK PURCHASES                | \$7,098                | \$2,368                 | \$9,466   |
| <u>CONSTRUCTION PURCHASES</u> |                        |                         |           |
| EMPLOYEE WAGES                | \$45,675               | \$10,575                | \$56,250  |
| PARK PURCHASES                | \$40,716               | \$13,585                | \$54,301  |
| TOTAL                         | \$440,382              | \$111,632               | \$552,014 |

TABLE 6 (continued)  
Result tables for example 3

TABLE 12B: LOCAL INCOME IMPACT, 1987,  
BY IMPACT SOURCE  
(OPTION 3 ), (\$ 1985 )

| IMPACT SOURCE                 | TYPES OF IMPACT |                         | TOTAL     |
|-------------------------------|-----------------|-------------------------|-----------|
|                               | DIRECT          | INDIRECT<br>AND INDUCED |           |
| VISITOR PURCHASES             | \$49,764        | \$16,604                | \$66,368  |
| <u>OPERATING EXPENDITURES</u> |                 |                         |           |
| EMPLOYEE WAGES                | \$320,000       | \$74,088                | \$394,088 |
| PARK PURCHASES                | \$7,150         | \$2,386                 | \$9,536   |
| <u>CONSTRUCTION PURCHASES</u> |                 |                         |           |
| EMPLOYEE WAGES                | \$79,170        | \$18,330                | \$97,500  |
| PARK PURCHASES                | \$70,574        | \$23,548                | \$94,122  |
| TOTAL                         | \$526,658       | \$134,956               | \$661,614 |

TABLE 13: LOCAL INCOME IMPACT 1985 - 1987,  
BY IMPACT SOURCE  
(OPTION 3 ), (\$ 1985 )

| IMPACT SOURCE                 | TYPES OF IMPACT |                         | TOTAL       |
|-------------------------------|-----------------|-------------------------|-------------|
|                               | DIRECT          | INDIRECT<br>AND INDUCED |             |
| VISITOR PURCHASES             | \$144,986       | \$48,376                | \$193,362   |
| <u>OPERATING EXPENDITURES</u> |                 |                         |             |
| EMPLOYEE WAGES                | \$930,000       | \$215,317               | \$1,145,317 |
| PARK PURCHASES                | \$21,372        | \$7,131                 | \$28,503    |
| <u>CONSTRUCTION PURCHASES</u> |                 |                         |             |
| EMPLOYEE WAGES                | \$169,759       | \$39,303                | \$209,062   |
| PARK PURCHASES                | \$151,320       | \$50,493                | \$201,820   |
| TOTAL                         | \$1,417,444     | \$360,420               | \$1,778,064 |

**TABLE 6 (continued)**  
**Result tables for example 3**

**TABLE 14: LOCAL INCOME IMPACT 1985 - 1987 ,  
 BY YEAR  
 (OPTION 3 ), (6 1985 )**

| <u>YEARS</u> | <u>TYPES OF IMPACT</u> |                                 | <u>TOTAL</u>       |
|--------------|------------------------|---------------------------------|--------------------|
|              | <u>DIRECT</u>          | <u>INDIRECT<br/>AND INDUCED</u> |                    |
| 1985         | \$440,382              | \$111,632                       | \$552,014          |
| 1986         | \$450,404              | \$114,033                       | \$564,436          |
| 1987         | \$526,658              | \$134,956                       | \$661,614          |
| <b>TOTAL</b> | <b>\$1,417,444</b>     | <b>\$360,620</b>                | <b>\$1,778,064</b> |

**TABLE 15: NUMBER OF LOCAL P.Y.'S DIRECTLY ASSOCIATED  
 WITH PARKS CANADA EXPENDITURES, BY YEAR,  
 IN PERSON-YEARS  
 (OPTION 3 )**

| <u>YEARS</u> | <u>TYPE OF EMPLOYEES</u> |                  | <u>TOTAL</u> |
|--------------|--------------------------|------------------|--------------|
|              | <u>CONSTRUCTION</u>      | <u>OPERATION</u> |              |
| 1985         | 1.7                      | 99.0             | 100.7        |
| 1986         | 1.7                      | 104.0            | 105.7        |
| 1987         | 2.9                      | 109.0            | 111.9        |
| <b>TOTAL</b> | <b>6.3</b>               | <b>312.0</b>     | <b>318.3</b> |

TABLE 6 (continued)  
Result tables for example 3

TABLE 16: LOCAL EMPLOYMENT IMPACT, 1985 - 1987 ,  
BY IMPACT SOURCE, IN PERSON-YEARS  
(OPTION 3 )

| <u>IMPACT SOURCE</u>          | <u>TYPES OF IMPACT</u> |                         | TOTAL |
|-------------------------------|------------------------|-------------------------|-------|
|                               | DIRECT                 | INDIRECT<br>AND INDUCED |       |
| VISITOR PURCHASES             | 17.9                   | 6.0                     | 23.8  |
| <u>OPERATING EXPENDITURES</u> |                        |                         |       |
| EMPLOYEE WAGES                | 312.0                  | 26.5                    | 338.5 |
| PARK PURCHASES                | 2.6                    | 0.9                     | 3.5   |
| <u>CONSTRUCTION PURCHASES</u> |                        |                         |       |
| EMPLOYEE WAGES                | 6.3                    | 4.8                     | 11.1  |
| PARK PURCHASES                | 18.7                   | 6.2                     | 24.9  |
| TOTAL                         | 357.4                  | 44.5                    | 401.9 |

TABLE 17: LOCAL EMPLOYMENT IMPACT 1985 - 1987 ,  
BY YEAR, IN PERSON-YEARS  
(OPTION 3 )

| <u>YEARS</u> | <u>TYPES OF IMPACT</u> |                         | TOTAL |
|--------------|------------------------|-------------------------|-------|
|              | DIRECT                 | INDIRECT<br>AND INDUCED |       |
| 1985         | 112.4                  | 13.8                    | 126.1 |
| 1986         | 117.4                  | 14.1                    | 131.5 |
| 1987         | 127.6                  | 16.6                    | 144.3 |
| TOTAL        | 357.4                  | 44.5                    | 401.9 |

TABLE 7

Data bank for example 4

Screen 1      GENERAL INFORMATION

- (1) Name of park/site    MINGANIE NATIONAL PARK
- (2) Option analyzed      4
- (3) First year to be analyzed      1985
- (4) Number of years to be analyzed    3    maximum 10
- (5) Number of types of visitors      1    maximum 4
- (6) Number of types of expenditures    1    maximum 5

Press F10 to continue - F5 to abort

Screen 2                    (8) NUMBER OF VISITOR-DAYS

(7) Types of visitors

TOTAL

|      |      |
|------|------|
| 1985 | 4900 |
| 1986 | 5050 |
| 1987 | 5200 |

Press F10 to continue - F5 to abort

TABLE 7 (continued)  
Data bank for example 4

Screen 3 (10) DAILY LOCAL EXPENDITURE OF VISITORS

|                           |       |                   |
|---------------------------|-------|-------------------|
|                           |       | Types of visitors |
| (9) Types of expenditures |       |                   |
|                           | TOTAL |                   |
| TOTAL                     | 33.00 |                   |

Press F10 to continue - F5 to abort

Screen 4

11: Operation expenditures of local goods and services by the park/site  
12: Local wages and salaries paid for operation of park/site  
13: Number of local p.y.'s directly associated with operation of park/site

|      |            |            |            |
|------|------------|------------|------------|
|      | *** 11 *** | *** 12 *** | *** 13 *** |
| 1985 | 27300      | 300000     | 99         |
| 1986 | 27400      | 310000     | 104        |
| 1987 | 27500      | 320000     | 109        |

Press F10 to continue - F5 to abort

TABLE 7 (continued)  
Data bank for example 4

Screen 5

14: Operation expend. of local goods and services by the park/site in 1985

13: Local goods and services purchased by local residents in 1985

|       | 000 14 000 | 000 15 000 |
|-------|------------|------------|
| TOTAL | 0          | 0          |

Press F10 to continue - F5 to abort

Screen 6

(16) Number of construction categories

1 maximum 4

Press F10 to continue - F5 to abort

TABLE 7 (continued)  
Data bank for example 4

Screen 7                      (18) CONSTRUCTION EXPENDITURES

(17) Categories of construction

|       |        |
|-------|--------|
| TOTAL |        |
| 1985  | 300000 |
| 1986  | 295000 |
| 1987  | 520000 |

Press F10 to continue - F5 to abort

Screen 8

(19) Distribution of purchases of local const. materials in 1985

|       |
|-------|
| TOTAL |
| 0.00  |

(20) Wages and salaries per dollar of construction  
(less profits and overhead)

|       |
|-------|
| TOTAL |
| .35   |

(21) Local material purchase per dollar of construction  
(less profits, overhead, salaries and wages)

|       |
|-------|
| TOTAL |
| .80   |

|                                                      |     |
|------------------------------------------------------|-----|
| (22) Profits and overhead per dollar of construction | .13 |
|------------------------------------------------------|-----|

|                                                 |     |
|-------------------------------------------------|-----|
| (23) % of construction wages paid in the region | .50 |
|-------------------------------------------------|-----|

|                                                          |        |
|----------------------------------------------------------|--------|
| (24) Weekly wage and salary in construction ind. in 1985 | 520.00 |
|----------------------------------------------------------|--------|

Press F10 to continue - F5 to abort

**TABLE 7 (continued)**  
**Data bank for example 4**

Screen 9

|                                                                   | K1  | K2  | K3  | K4  | K5  | K6     |
|-------------------------------------------------------------------|-----|-----|-----|-----|-----|--------|
| (25)                                                              | .62 | .28 | .26 | .29 | .30 | .12    |
| (26) Total sales of local firms in 1985                           |     |     |     |     |     | 0      |
| (27) % sales must increase to create one job in 1985              |     |     |     |     |     | 1.30   |
| (28) Weekly average salaries in local firms in 1985               |     |     |     |     |     | 120.00 |
| (29) Total local firms p.y.'s in 1985                             |     |     |     |     |     | 0      |
| (30) Local residents' total income in 1985                        |     |     |     |     |     | 0      |
| (31) Local employees and employers income per purchase \$ in 1985 |     |     |     |     |     |        |
| TOTAL                                                             |     |     |     |     |     |        |
|                                                                   |     |     |     |     |     | 6.00   |
| (32) Ratio of firms' local purchases to total sales in 1985       |     |     |     |     |     |        |
| TOTAL                                                             |     |     |     |     |     |        |
|                                                                   |     |     |     |     |     | 0.00   |

Press F10 to continue - F3 to abort

**TABLE 8**

**Result tables for example 4**

**TABLE 1: NUMBERS OF VISITOR-DAYS, BY TYPE OF VISITOR  
(OPTION 4 )**

| <u>YEARS</u> | <u>TOTAL</u> |
|--------------|--------------|
| 1985         | 4,900        |
| 1986         | 3,850        |
| 1987         | 5,200        |

**TABLE 2: DAILY VISITOR LOCAL EXPENDITURES  
(OPTION 4 ), (8 1985 )**

TYPES OF EXPENDITURES

**TOTAL** 833.00

**TABLE 3: VISITOR LOCAL EXPENDITURES, BY TYPE OF VISITOR  
(OPTION 4 ), (8 1985 )**

| <u>YEARS</u> | <u>TOTAL</u> |
|--------------|--------------|
| 1985         | 8161,700     |
| 1986         | 8166,650     |
| 1987         | 8171,600     |

**TABLE 4: VISITOR LOCAL EXPENDITURES, BY TYPE OF EXPENDITURE  
(OPTION 4 ), (8 1985 )**

| <u>YEARS</u> | <u>TOTAL</u>    |
|--------------|-----------------|
| 1985         | 8161,700        |
| 1986         | 8166,650        |
| 1987         | 8171,600        |
| <b>TOTAL</b> | <b>8499,950</b> |

**TABLE 8 (continued)**  
**Result tables for example 4**

**TABLE 5: PARKS CANADA OPERATING EXPENDITURES MADE LOCALLY  
(OPTION 4 ), (6 1985 )**

| <u>YEARS</u> | <u>LOCAL GOODS<br/>AND SERVICES</u> | <u>WAGE BILL TO<br/>LOCAL EMPLOYEES</u> | <u>TOTAL</u> |
|--------------|-------------------------------------|-----------------------------------------|--------------|
| 1985         | 627,300                             | 6300,000                                | 6327,300     |
| 1986         | 627,400                             | 6310,000                                | 6337,400     |
| 1987         | 627,500                             | 6320,000                                | 6347,500     |

**TABLE 6: PARKS CANADA OPERATION EXPENDITURES ON LOCAL GOODS AND SERVICES  
BY TYPE OF EXPENDITURE  
(OPTION 4 ), (6 1985 )**

NOT AVAILABLE

**TABLE 7: PARKS CANADA CONSTRUCTION EXPENDITURES,  
BY TYPE OF CONSTRUCTION  
(OPTION 4 ), (6 1985 )**

| <u>YEARS</u> | <u>TOTAL</u> |
|--------------|--------------|
| 1985         | 6300,000     |
| 1986         | 6295,000     |
| 1987         | 6320,000     |

**TABLE 8: PROFITS, SALARIES AND LOCAL EXPENDITURE ON  
CONSTRUCTION MATERIALS  
(OPTION 4 )**

WEEKLY AVERAGE WAGES AND SALARIES: 6520.0

LOCAL % OF CONSTRUCTION WAGES AND SALARIES: 0.50

PROFITS AND OVERHEAD PER % OF CONSTRUCTION: 0.13

WAGES AND SALARIES PER % OF CONSTRUCTION (LESS PROF.): 0.35

PURCHASES OF LOCAL MATERIALS PER % OF CONST. (LESS PROF. AND SAL.): 0.00

**DISTRIBUTION OF LOCAL MATERIAL PURCHASES BY TYPE OF EXPENDITURES**  
NOT AVAILABLE

**TABLE 8 (continued)**  
**Result tables for example 4**

**TABLE 9: PARKS CANADA LOCAL CONSTRUCTION EXPENDITURES**  
**(OPTION 4 ), (0 1985 )**

| <u>YEARS</u> | <u>LOCAL GOODS<br/>AND SERVICES</u> | <u>WAGE BILL TO<br/>LOCAL EMPLOYEES</u> | <u>TOTAL</u> |
|--------------|-------------------------------------|-----------------------------------------|--------------|
| 1985         | 0135,720                            | 045,675                                 | 0181,395     |
| 1986         | 0133,450                            | 044,914                                 | 0178,372     |
| 1987         | 0235,240                            | 079,170                                 | 0314,410     |

**TABLE 10: INFORMATION REQUIRED FOR PARAMETER ESTIMATES**  
**AND TO INCOME MULTIPLIER, 1985**  
**(OPTION 4 ), (0 1985 )**

**TOTAL SALES OF LOCAL FIRMS: NOT AVAILABLE**

**TOTAL EMPLOYMENT OF LOCAL FIRMS(P.Y.'S): NOT AVAILABLE**

**WEEKLY AVERAGE WAGES AND SALARIES IN LOCAL FIRMS: 0120.00**

**PROP. LOCAL SALES INCREASE NECESSARY TO CREATE ONE JOB: 1.30**

**LOCAL PURCHASES BY LOCAL RESIDENTS: NOT AVAILABLE**

**TOTAL INCOME OF LOCAL RESIDENTS: NOT AVAILABLE**

**INCOME OF LOCAL EMPLOYEES AND EMPLOYERS PER PURCHASE 0: NOT AVAILABLE**

**LOCAL PURCHASES BY LOCAL FIRMS ON THEIR TOTAL SALES: NOT AVAILABLE**

**TABLE 8 (continued)**  
**Result tables for example 4**

**TABLE 11: K1,K2,K3,K4,K5,K6 PARAMETER VALUES  
AND K11,K12 MULTIPLIER VALUES  
(OPTION 4 )**

| <u>PARAMETERS</u>  |      |      |      |      |      |
|--------------------|------|------|------|------|------|
| K1                 | K2   | K3   | K4   | K5   | K6   |
| 0.62               | 0.28 | 0.26 | 0.29 | 0.30 | 0.12 |
| <u>MULTIPLIERS</u> |      |      |      |      |      |
| K11                | K12  |      |      |      |      |
| 1.21               | 1.14 |      |      |      |      |

K1 = AVERAGE PROPENSITY TO CONSUME LOCALLY.  
 K2 = PROPORTION OF PURCHASES OF RESIDENTS THAT RESULTS IN LOCAL INCOME.  
 K3 = PROPORTION OF PURCHASES OF PARK THAT RESULTS IN LOCAL INCOME.  
 K4 = PROPORTION OF PURCHASES OF VISITORS THAT RESULTS IN LOCAL INCOME.  
 K5 = PROPORTION OF CONS. MATERIAL PURCHASES THAT RESULTS IN LOCAL INCOME.  
 K6 = PROPORTION OF LOCAL FIRMS LOCAL PURCHASES ON THEIR SALES.

K11 = INDUCED EFFECT MULTIPLIER  
 K12 = INDIRECT EFFECT MULTIPLIER

**TABLE 12A: LOCAL INCOME IMPACT, 1985 ,  
BY IMPACT SOURCE  
(OPTION 4 ), (6 1985 )**

| <u>IMPACT SOURCE</u>          | <u>TYPES OF IMPACT</u> |                         | TOTAL     |
|-------------------------------|------------------------|-------------------------|-----------|
|                               | DIRECT                 | INDIRECT<br>AND INDUCED |           |
| VISITOR PURCHASES             | \$46,893               | \$16,245                | \$63,138  |
| <u>OPERATING EXPENDITURES</u> |                        |                         |           |
| EMPLOYEE WAGES                | \$300,000              | \$70,122                | \$370,122 |
| PARK PURCHASES                | \$7,098                | \$2,459                 | \$9,557   |
| <u>CONSTRUCTION PURCHASES</u> |                        |                         |           |
| EMPLOYEE WAGES                | \$45,675               | \$10,676                | \$56,351  |
| PARK PURCHASES                | \$40,716               | \$14,105                | \$54,821  |
| TOTAL                         | \$440,382              | \$113,608               | \$553,990 |

**TABLE 8 (continued)**  
**Result tables for example 4**

**TABLE 12B: LOCAL INCOME IMPACT, 1987 ,  
 BY IMPACT SOURCE  
 (OPTION 4 ), (6 1985 )**

| <u>IMPACT SOURCE</u>          | <u>TYPES OF IMPACT</u> |                                 | <u>TOTAL</u> |
|-------------------------------|------------------------|---------------------------------|--------------|
|                               | <u>DIRECT</u>          | <u>INDIRECT<br/>AND INDUCED</u> |              |
| VISITOR PURCHASES             | \$49,764               | \$17,240                        | \$67,004     |
| <u>OPERATING EXPENDITURES</u> |                        |                                 |              |
| EMPLOYEE WAGES                | \$320,000              | \$74,797                        | \$394,797    |
| PARK PURCHASES                | \$7,150                | \$2,477                         | \$9,627      |
| <u>CONSTRUCTION PURCHASES</u> |                        |                                 |              |
| EMPLOYEE WAGES                | \$79,170               | \$18,505                        | \$97,675     |
| PARK PURCHASES                | \$70,574               | \$24,449                        | \$95,024     |
| TOTAL                         | \$526,658              | \$137,468                       | \$664,127    |

**TABLE 13: LOCAL INCOME IMPACT 1985 - 1987 ,  
 BY IMPACT SOURCE  
 (OPTION 4 ), (6 1985 )**

| <u>IMPACT SOURCE</u>          | <u>TYPES OF IMPACT</u> |                                 | <u>TOTAL</u> |
|-------------------------------|------------------------|---------------------------------|--------------|
|                               | <u>DIRECT</u>          | <u>INDIRECT<br/>AND INDUCED</u> |              |
| VISITOR PURCHASES             | \$144,906              | \$50,228                        | \$195,213    |
| <u>OPERATING EXPENDITURES</u> |                        |                                 |              |
| EMPLOYEE WAGES                | \$930,000              | \$217,379                       | \$1,147,379  |
| PARK PURCHASES                | \$21,372               | \$7,404                         | \$28,776     |
| <u>CONSTRUCTION PURCHASES</u> |                        |                                 |              |
| EMPLOYEE WAGES                | \$169,759              | \$39,679                        | \$209,438    |
| PARK PURCHASES                | \$151,328              | \$52,425                        | \$203,753    |
| TOTAL                         | \$1,417,444            | \$347,114                       | \$1,764,558  |

**TABLE 8 (continued)**  
**Result tables for example 4**

**TABLE 14: LOCAL INCOME IMPACT 1985 - 1987 ,  
 BY YEAR  
 (OPTION 4 ), (6 1985 )**

| <u>YEARS</u> | <u>TYPES OF IMPACT</u> |                                 | <u>TOTAL</u>      |
|--------------|------------------------|---------------------------------|-------------------|
|              | <u>DIRECT</u>          | <u>INDIRECT<br/>AND INDUCED</u> |                   |
| 1985         | 8440,382               | 8113,600                        | 8553,990          |
| 1986         | 8450,404               | 8116,838                        | 8566,442          |
| 1987         | 8526,658               | 8137,468                        | 8664,127          |
| <b>TOTAL</b> | <b>81,417,444</b>      | <b>8367,114</b>                 | <b>81,784,558</b> |

**TABLE 15: NUMBER OF LOCAL P.Y.'S DIRECTLY ASSOCIATED  
 WITH PARKS CANADA EXPENDITURES, BY YEAR,  
 IN PERSON-YEARS  
 (OPTION 4 )**

| <u>YEARS</u> | <u>TYPE OF EMPLOYEES</u> |                  | <u>TOTAL</u> |
|--------------|--------------------------|------------------|--------------|
|              | <u>CONSTRUCTION</u>      | <u>OPERATION</u> |              |
| 1985         | 1.7                      | 99.0             | 100.7        |
| 1986         | 1.7                      | 104.0            | 105.7        |
| 1987         | 2.9                      | 109.0            | 111.9        |
| <b>TOTAL</b> | <b>6.3</b>               | <b>312.0</b>     | <b>318.3</b> |

TABLE 8 (continued)

Result tables for example 4

TABLE 16: LOCAL EMPLOYMENT IMPACT, 1985 - 1987 ,  
BY IMPACT SOURCE, IN PERSON-YEARS  
(OPTION 4 )

| <u>IMPACT SOURCE</u>          | <u>TYPES OF IMPACT</u> |                         | TOTAL |
|-------------------------------|------------------------|-------------------------|-------|
|                               | DIRECT                 | INDIRECT<br>AND INDUCED |       |
| VISITOR PURCHASES             | 17.9                   | 6.2                     | 24.1  |
| <u>OPERATING EXPENDITURES</u> |                        |                         |       |
| EMPLOYEE WAGES                | 312.0                  | 26.8                    | 338.8 |
| PARK PURCHASES                | 2.6                    | 0.9                     | 3.5   |
| <u>CONSTRUCTION PURCHASES</u> |                        |                         |       |
| EMPLOYEE WAGES                | 6.3                    | 4.9                     | 11.2  |
| PARK PURCHASES                | 18.7                   | 6.5                     | 25.1  |
| TOTAL                         | 357.4                  | 45.3                    | 402.7 |

TABLE 17: LOCAL EMPLOYMENT IMPACT 1985 - 1987 ,  
BY YEAR, IN PERSON-YEARS  
(OPTION 4 )

| <u>YEARS</u> | <u>TYPES OF IMPACT</u> |                         | TOTAL |
|--------------|------------------------|-------------------------|-------|
|              | DIRECT                 | INDIRECT<br>AND INDUCED |       |
| 1985         | 112.4                  | 14.0                    | 126.4 |
| 1986         | 117.4                  | 14.3                    | 131.7 |
| 1987         | 127.6                  | 16.9                    | 144.6 |
| TOTAL        | 357.4                  | 45.3                    | 402.7 |